Vol. 986 Number 2

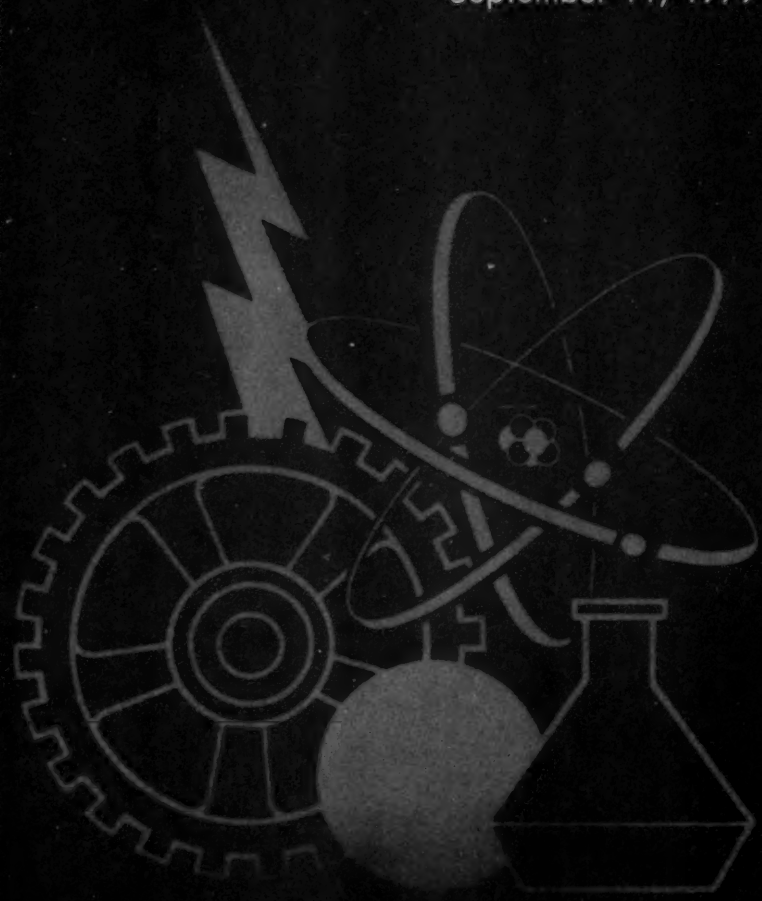
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

September 11, 1979



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

September 11, 1979 Volume 986 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT, including the amounts of the fees thereunder and the States that may be designated in international applications, consult the notice entitled "Update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 3, 1979.

Effective August 1, 1979 the international fees are increased to the following amounts:

Basic fee under PCT Rule 15.1(i) for an international application containing 30 sheets or less	$190.00
Supplemental fee to the Basic fee for each page of an international application in excess of 30 sheets	3.50
Designation fee under PCT Rule 15.1(ii)	45.00

LUTRELLE F. PARKER,
Acting Commissioner of Patents and Trademarks.

July 3, 1979.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,414,948, Re. S.N. 021,001, Filed Mar. 16, 1979, Cl. 24/205.13, THERMOPLASTIC STRIPS FOR SLIDING CLASP FASTENERS, Eric Engel Cuckson, et al., Owner of Record: *Scovill Manufacturing Company, Waterbury, Conn.,* Attorney or Agent: Dallett Hoopes, Ex. Gp.: 351

3,665,323, Re. S.N. 049,868, Filed Jun. 18, 1979, Cl. 328/14, PROPORTIONAL DIGITAL CONTROL FOR RADIO FREQUENCY SYNTHESIZERS, Max E. Peterson, Owner of Record: *Collins Radio Co., Dallas, Tex.,* Attorney or Agent: Howard R. Greenberg, et al., Ex. Gp.: 254

3,849,989, Re. S.N. 046,491, Filed Jun. 7, 1979, Cl. 405/68, INFLATABLE BARRIER FOR SUBSTANCES FLOATING ON WATER, Paul Preus, Owner of Record: *Inventor,* Attorney or Agent: Harold L. Stowell, Ex. Gp.: 351

3,968,156, Re. S.N. 001,633, Filed Jan. 5, 1979, Cl. 260/543 P, PROCESS FOR PREPARING ALKYL- OR ARYLPHOSPHONOTHIOIC DIHALIDES, Eugene H. Uhing, et al., Owner of Record: *Stauffer Chemical Co., Westport, Conn.,* Attorney or Agent: Daniel S. Ortiz, et al., Ex. Gp.: 126

3,981,945, Re. S.N. 047,244, Filed Jun. 11, 1979, Cl. 260/900, COATING COMPOSITIONS COMPRISING A POLYSULFONE AND A FLUOROCARBON POLYMER, Terence Edwin Attwood, et al., Owner of Record: *Imperial Chemical Industries Limited, London, England,* Attorney or Agent: John W. Malley, et al., Ex. Gp.: 142

4,128,177, Re. S.N. 048,276, Filed Jun. 13, 1979, Cl. 211/49 D, DISPLAY RACK WITH IMPROVED SHELF ASSEMBLY, Rafael T. Bustos, Owner of Record: *Leggett and Platt, Inc., Carthage, Mo.,* Attorney or Agent: Herbert C. Brinkman, et al., Ex. Gp.: 355

4,139,302, Re. S.N. 046,587, Filed Jun. 6, 1979, Cl. 356/32, METHOD AND APPARATUS FOR INTERFEROMETRIC DEFORMATION ANALYSIS, Yau Y. Hung, et al., Owner of Record: *Ralph M. Grant Engineering Consultant, Inc., Rochester, Mich.,* Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 257

PATENT NOTICES

Certificates of Correction for the Week of Sept. 11, 1979

RE. 29,954	4,123,061	4,146,761	4,152,000
D. 251,495	4,126,463	4,147,174	4,152,155
3,903,017	4,130,435	4,147,533	4,152,169
3,984,516	4,131,751	4,147,871	4,152,251
3,989,665	4,132,637	4,147,879	4,152,467
3,996,262	4,133,058	4,147,931	4,153,019
4,013,964	4,134,581	4,147,990	4,153,563
4,022,329	4,135,853	4,148,080	4,153,579
4,026,949	4,136,150	4,148,124	4,153,589
4,035,664	4,136,254	4,148,146	4,153,725
4,036,871	4,137,044	4,148,223	4,153,890
4,039,476	4,137,179	4,148,288	4,154,008
4,044,005	4,137,211	4,148,412	4,154,033
4,045,476	4,137,669	4,148,560	4,154,421
4,046,795	4,137,967	4,148,836	4,154,555
4,051,352	4,138,658	4,148,906	4,154,634
4,055,434	4,139,266	4,149,133	4,154,657
4,059,576	4,139,845	4,149,392	4,154,816
4,059,641	4,139,898	4,149,456	4,154,864
4,060,811	4,139,905	4,149,504	4,154,902
4,070,343	4,140,655	4,149,581	4,155,393
4,077,422	4,140,791	4,149,625	4,155,477
4,078,058	4,140,980	4,149,667	4,155,628
4,082,726	4,141,546	4,149,819	4,155,671
4,090,253	4,142,148	4,149,862	4,155,746
4,091,221	4,142,155	4,149,960	4,156,423
4,095,772	4,143,904	4,149,977	4,156,676
4,097,441	4,143,985	4,150,096	4,156,729
4,098,893	4,144,221	4,150,131	4,156,768
4,099,196	4,144,253	4,150,193	4,156,909
4,102,656	4,144,411	4,150,205	4,156,949
4,103,254	4,145,248	4,150,360	4,156,961
4,107,246	4,145,395	4,150,631	4,157,149
4,110,286	4,145,432	4,150,680	4,157,813
4,110,315	4,145,506	4,150,707	4,158,499
4,115,403	4,145,671	4,150,872	4,158,666
4,116,249	4,145,892	4,151,176	4,159,045
4,117,010	4,146,162	4,151,485	4,159,185
4,122,020	4,146,177	4,151,879	4,159,360.
4,122,059	4,146,698	4,151,890	
4,122,102	4,146,754	4,151,920	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6786
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library. Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 28, 1979

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-8-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines: Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-18-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink: Adhesive and Abrading Compositions; Molding, Shaping, Treating Processes, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	10-13-78
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	6-21-78
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	3-6-78
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-19-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear and Reactors; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptograph; Laser Devices; Radioactive Materials; Power Metallurgy, Rocket Fuels.	4-10-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-12-78
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	6-7-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	1-31-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	6-21-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-1-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	9-25-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	7-21-78
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange: Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	6-9-78
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Textiles; Apparel and Shoes; Sewing Machines; Machine Elements; Clutches.	2-16-78

Expiration of patents: The patents within the range of numbers indicated below expire during July 1979, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,041,614 to 3,047,872, inclusive
Plant Patents..... Numbers 2,155 to 2,159, inclusive

REISSUES

SEPTEMBER 11, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

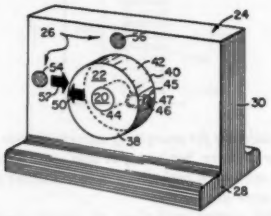
Re. 30,092
MUCUS TESTING PROCESSES AND DEVICES

Samuel R. Schuster, Wellesley, Mass., assignor to Ovutime, Inc., Newton, Mass.

Original No. 3,982,423, dated Sep. 28, 1976, Ser. No. 523,047, Nov. 12, 1974. Continuation-in-part of Ser. No. 462,298, Apr. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 433,767, Jan. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 300,187, Oct. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 472,611, May 23, 1974, abandoned, which is a continuation-in-part of said Ser. No. 300,187. Application for reissue Sep. 25, 1978, Ser. No. 945,080

Int. Cl.[2] G01N *33/16*

U.S. Cl. 73—54 **7 Claims**



1. A device for testing mucus from a bodily cavity, said device comprising a base, inner bearing means and outer bearing means composed of glass, said inner bearing means and said outer bearing means being arranged for motion with respect to each other on said base, means for biasing said inner bearing means and said outer bearing means for said motion, and means for indicating the occurrence of said motion, said inner bearing means and said outer bearing means have inner and outer cylindrical bearing surfaces, each of said bearing surfaces having a surface finish ranging from approximately 0.2 microns to 3.2 microns in valley to peak height, the clearance between said bearing surfaces ranging from approximately 0.25 microns to 254.0 microns, said means for indicating including indicia movable with at least one of said bearing elements and indicia fixed in operation with respect to said base, said base including an upright plate having a slot, said inner bearing member having a key, said key being removably retained by said slot, one of said indicia being located on said plate and the other of said indicia being located on said outer bearing member.

Re. 30,093
AEROSOL DISPENSING SYSTEM

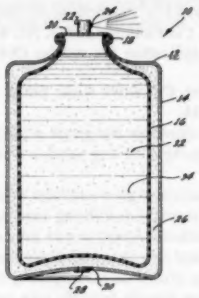
Norman D. Burger, 11621 Segrell Way, Culver City, Calif. 90230

Original No. 3,938,708, dated Feb. 17, 1976, Ser. No. 544,390, Jan. 27, 1975. Continuation-in-part of Ser. No. 497,613, Aug. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 466,140, May 2, 1974, abandoned. Application for reissue Jan. 6, 1978, Ser. No. 867,456

Int. Cl.[2] B65D *35/28*

U.S. Cl. 222—95 **35 Claims**

1. An aerosol dispensing system comprising:
an outer container;
compressible inner container means positioned within said outer container;
means to compress said inner container means positioned between said inner container means and said outer container;
a mechanical breakup spray head and valve assembly connected to said inner container means; *said mechanical breakup spray head including a discharge orifice and a swirl chamber with the material being discharged passing through the swirl chamber and being subjected to centrifugal force therein before being ejected through said discharge orifice;*
a relatively non-foaming liquid product at a pressure above atmospheric pressure within said inner container means due to the force exerted on the inner container means by said means to compress said inner container means;
a neutral propellant within said inner container means;



said neutral propellant being in a liquid state at the pressure within said inner container means and being at least partially soluble or misçible in said liquid product, and
said neutral propellant being at least partially vaporized at atmospheric pressure or less on passage of said product and neutral propellant through said spray head to create a turbulence within said spray head which produces breaking up of said liquid product into a fine spray.

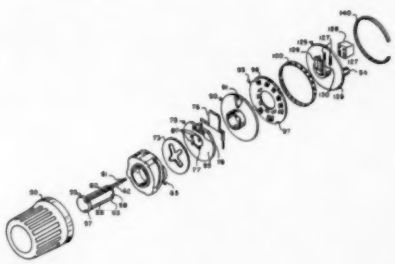
Re. 30,094
OPTOELECTRONIC SWITCH

Carlos L. Beeck, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Original No. 3,946,225, dated Mar. 23, 1976, Ser. No. 492,625, Jul. 29, 1974. Application for reissue Oct. 31, 1977, Ser. No. 846,733

Int. Cl.[2] G01D *5/34*

U.S. Cl. 250—229 **7 Claims**



14. An optoelectronic switch, comprising
a rotatable housing,
a masking member mounted within and coupled to said housing for rotation therewith, said member including a plurality of light transmissive windows,
stationary light sensitive means disposed within said housing

facing one side of said masking member for detecting incident light and generating an electrical signal proportional thereto, and

stationary light source means disposed within said housing facing the opposite side of said masking member for directing light toward said light sensitive means,

light from said source means passing through certain of said windows at different rotational positions of said housing to illuminate said light sensitive means and thereby produce electrical output signals at such positions.

Re. 30,095

DISPLAY PANEL USING GLOW SPREADING PRINCIPLES

Donald E. Miller, Stockton, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Original No. 3,978,371, dated Aug. 31, 1976, Ser. No. 569,222, Apr. 18, 1975. Continuation of Ser. No. 448,551, Mar. 6, 1974, abandoned. Application for reissue Oct. 25, 1977, Ser. No. 845,104

Int. Cl.[2] **G09F** *9/00;* **H01J** *61/10*

U.S. Cl. 340—714 **41 Claims**

31. A gaseous discharge bar graph display comprising

an envelope having a viewing window and containing an ionizable gas,

an array of successive glow cathodes disposed along a surface within said envelope and facing said viewing window,

each of said cathodes having a scan area and a display area on its surface, said scan area and display area being separated by a mechanical divider on the surface of the cathode which acts to inhibit glow transfer from the scan area to the display area,

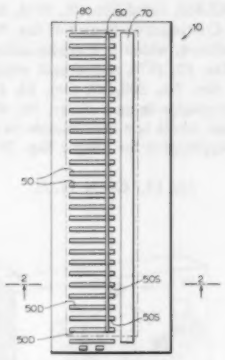
the scan area of each such cathode being small in comparison to the display area,

the scan areas of the successive cathodes being aligned and each scan area being in gas communication and glow priming relationship with its associated display area and with the scan area of the next succeeding cathode, so that each scan area, when it glows, primes its associated display area and the scan area of the next succeeding cathode,

scanning means for scanning the scan areas of said cathodes one after another, from one end of the array toward the other, and

display means for producing a glow discharge along the surface of a selected one of said display areas, at a selected distance from said one end of the array, to represent by such distance a parameter of an input signal being received,

said scanning means including first conductor means connected



to said cathodes for energizing successive ones of said cathodes one after another, beginning at said one end of the array, and causing each such cathode in turn to exhibit a glow discharge over its scan area,

said display means including an anode electrode means in operative glow discharge relationship with each of said cathodes and a second conductor means connected to said anode electrode means to increase the current flow therethrough when the scanning of the scan areas reaches said selected cathode.

PLANT PATENTS

GRANTED SEPTEMBER 11, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,459

ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 11, 1978, Ser. No. 941,247

Int. Cl.[2] **A01H** *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its heavily branched, upright plant, China Rose bud color opening to Neyron Rose, and its slight fragrance.

PATENTS

GRANTED SEP. 11, 1979

ERRATA

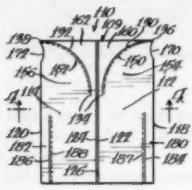
For CLASS	See PATENT NO.
051–229	4,167,085
417–354	4,167,376
123–032 EE	4,167,396
435–045	4,167,446
435–178	4,167,447
435–070	4,167,448
435–016	4,167,449
435–003	4,167,450
585–274	4,167,529
585–475	4,167,530
585–854	4,167,531
585–622	4,167,532
585–251	4,167,533
585–018	4,167,534
585–717	4,167,535
525–450	4,167,536
525–443	4,167,537
525–438	4,167,538
525–117	4,167,539
525–135	4,167,540
525–444	4,167,541
525–445	4,167,542
525–074	4,167,543
525–099	4,167,544
525–122	4,167,545
525–275	4,167,546
521–027	4,167,551
428–328	4,167,582
356–401	4,167,677
358–055	4,167,707
362–236	4,167,783

PATENTS

GRANTED SEPTEMBER 11, 1979

GENERAL AND MECHANICAL

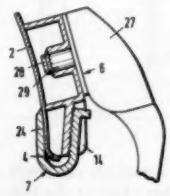
4,167,042
UNITARY GARMENT
Maria Xtazy de Million-Czarnecki, 579 Hawthorne Pl., Chicago, Ill. 60657
Filed Jun. 1, 1978, Ser. No. 911,364
Int. Cl.[2] A41D *1/22*; A41B *9/00*
U.S. Cl. 2—105 **22 Claims**



1. A garment comprising a unitary sheet of material forming superposed, unitary front and back panels connected to one another along a longitudinal fold in said sheet;

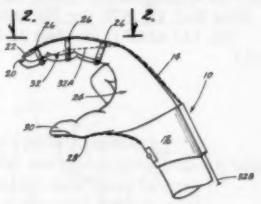
said front and back panels being provided with substantially contiguous arcuate cuts which extend outwardly toward one end of said panels, curve toward a corner of said panels, and together define an arm and shoulder covering element for said garment between said cuts but unitary with said sheet, and the cut edges of the front and back panels of said arm and shoulder covering elements being seamed together so as to define a unitary shoulder and sleeve for said garment.

4,167,043
APPARATUS FOR SECURING A HEARING PROTECTOR TO A PROTECTIVE HELMET
Guenter Hartig, Rodenbach, Fed. Rep. of Germany, assignor to Optac Wilfrid Weltin, Roden, Fed. Rep. of Germany
Filed Jan. 30, 1978, Ser. No. 873,675
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1979, 2705348
Int. Cl.[2] A41D *21/00*; A42B *3/00*
U.S. Cl. 2—423 **6 Claims**



1. An apparatus for securing a hearing or ear protection means to a protective helmet having a rim, comprising a support member (6) for said protection means (27), said support member resting on the protective helmet, separate U-shaped holding means (7) reaching around the rim of the helmet, said support member comprising a land with a first row of detent connection means (11) facing substantially outwardly, said U-shaped holding means having a second row of detent connection means (20) facing substantially inwardly for cooperation with said first row of detent connection means whereby said first and second row of detent connection means are operatively interposed between the support member and the holding means for releasably engaging and disengaging the support member and the holding means.

4,167,044
MEANS FOR ACTUATING ARTIFICIAL OR DISABLED ARM MEMBERS
Leon E. Girard, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa
Filed Feb. 23, 1978, Ser. No. 880,367
Int. Cl.[2] A61F *1/00*, *1/06*
U.S. Cl. 3—1 **6 Claims**



1. In combination,

a prosthesis adapted to be secured to a person's hand, said prosthesis comprising a rigid thumb supporting portion and a flexible finger supporting portion, said finger supporting portion having a normal flexure whereby the fingers being supported thereby are normally maintained in an open position with respect to the supported thumb,

an elongated flexible cable member having one end operatively secured to said finger supporting portion for moving said supported fingers towards a closed position, relative to the supported thumb, when said cable member is moved in one direction, the other end of said cable member being adapted to be operatively secured to a movable portion of the person's body,

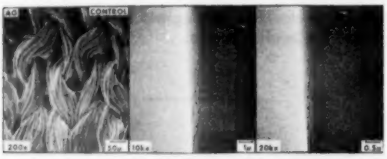
and a mechanical control operatively connected to said cable member for opening said supported fingers, maintaining a fixed position of said supported fingers and closing said supported fingers upon the execution of a single impulse by the person,

said mechanical control including control means for locking said supported fingers in a fixed closed position upon a quick instantaneous release of said cable, and for releasing said supported fingers to permit said fingers to move towards an open position when said cable is slowly and gradually released.

4,167,045
CARDIAC AND VASCULAR PROSTHESES
Philip N. Sawyer, Brooklyn, N.Y., assignor to Interface Biomedical Laboratories Corp., Brooklyn, N.Y.
Filed Aug. 26, 1977, Ser. No. 827,952
Int. Cl.[2] A61F *1/24*, *1/22*
U.S. Cl. 3—1.4 **2 Claims**

1. A prosthesis suitable for implantation in a bloody environment, said prosthesis comprising a surface material adapted for exhibiting a regular and periodic surface charge characteristic

in said environment, and prosthesis means supporting said surface material and adapted to perform a prosthetic function



in said environment, said surface material being agar, said prosthesis means being of Dacron.

4,167,046

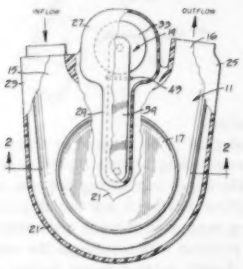
BLOOD PUMPING DEVICE

Peer M. Portner, Berkeley, and Jal S. Jassawalla, San Francisco, both of Calif., assignors to Andros, Inc., Berkeley, Calif.

Filed Dec. 12, 1977, Ser. No. 859,915

Int. Cl.[2] A61F *1/24;* F04B *17/00*

U.S. Cl. 3—1.7 **8 Claims**



1. A blood pumping device for internal use in humans or animals and comprising, a deformable sac having in the nondeformed configuration a pair of opposite substantially parallel and planar walls of substantially circular shape joined by an annular wall of substantially semicircular cross-section, said sac being formed in a unitary seamless piece of flexible resilient material and having inlet and outlet means in said annular wall, a pair of plates disposed on opposite sides of said sac, each of said plates being engageable with a respective one of said planar walls of said sac for displacing said planar walls toward each other to deform said sac, and means for periodically displacing both of said plates simultaneously toward each other.

4,167,047

SHANKS FOR KNEE-JOINT ENDOPROSTHESES

Hans Grundei, Hohlandstr. 56; Joachim Henssage, Trentsaal 7; Wolfram Thomas, Zwinglistr. 1, and Gerhard Schutt, Lothringer Str. 39, all of D-2400 Lübeck, Fed. Rep. of Germany

Filed Mar. 2, 1977, Ser. No. 773,395

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1976, 2610922

Int. Cl.[2] A61F *1/24*

U.S. Cl. 3—1.911 **5 Claims**

1. In an elongated shank for knee-joint endoprosthesis which, when the prosthesis is implanted, is inserted in a space prepared in the spongiose and marrow of the medullar bone cavity to receive the shank which is to be cemented in the bone, the improvement consisting in that the cross-section of at least that length portion of the shank body which projects into the medullar cavity of said bone is anatomically matched substantially to the cross-sectional shape of the medullar cavity but is smaller in cross-section than the medullar cavity thereby to provide clearance to allow for individual bone differences, the end of the shank adjacent to the prosthesis having a flange-like collar with support faces on its surface adjacent to the shank body to axially limit insertion of the shank, said shank

being substantially egg-shaped in outline corresponding to the medullar cavity of a leg bone, said shank body having a tapering axial bore at the end nearer the prosthesis and said bore having a widened end to receive the prosthesis, and an indexing means located on said collar with which a corresponding index means on the prosthesis can be brought into alignment.

4,167,048

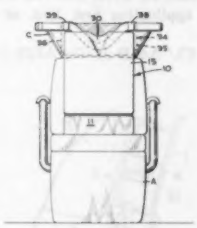
PORTABLE SHAMPOO SEAT ADAPTER WITH LIQUID RUN-OFF ATTACHMENT

Mary E. Williams, 3269 Tribol La., San Jose, Calif. 95122

Filed Dec. 19, 1977, Ser. No. 861,900

Int. Cl.[2] A47K *3/12*

U.S. Cl. 4—159 **3 Claims**



1. In combination, a portable children's auxiliary shampoo chair seated on a barber chair or the like, said portable children's auxiliary shampoo chair comprising:

(a) a seat;

(b) a back rest extending upwardly from said seat, said back rest comprising an arcuate neck rest formed at the top of said back rest to accommodate the back of the neck of a child;

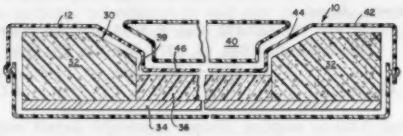
(c) run-off attachment means comprising wing-like drain guides extending outwardly and downwardly from said neck rest, said run-off attachment means coacting with said neck rest to produce a saddle configuration to collect and guide liquid dripping from the head of a child into a drain receptacle; and

(d) means interconnecting said seat and said back rest for pivotally moving said back rest relative to said seat.

4,167,049
WATERBED FRAME COVER

Isaac Fogel, Silver Spring, Md., assignor to Classic Products Corporation, Beltsville, Md.

Filed Feb. 23, 1978, Ser. No. 880,471
Int. Cl.[2] A47C 27/08
U.S. Cl. 5—402 5 Claims



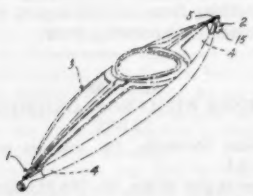
1. A waterbed frame cover of waterproof vinyl plastic for covering a waterbed frame which includes a decking board, upstanding peripheral sides bonded to the decking board and a mattress pad bonded to the decking board, where the decking board, the peripheral sides and mattress pad form a contoured cavity surface for supporting a water-filled mattress, comprising:

a bottom waterproof plastic sheet, which covers the outside surface of the decking board of the waterbed frame, a top waterproof plastic sheet which covers the contoured cavity surface of the waterbed frame, said bottom sheet and said top sheet having matching side walls and end walls, said bottom sheet being joined at one end along a matching end wall, a closure extending around said side walls and the other of said end walls to seal said waterbed frame cover.

4,167,050
VERTICAL STABILIZER FOR KAYAK

Pierre Arcouette, 39 Montagne St. - Apt. 21, Granby, Quebec, Canada

Filed Jun. 14, 1978, Ser. No. 915,535
Int. Cl.[2] A45F 3/15
U.S. Cl. 9—1.4 2 Claims

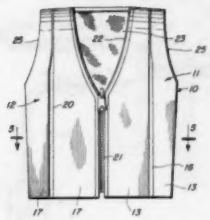


1. A vertical stabilizer for a kayak comprising a hollow body molded in one piece and including an open, flared base end portion defining a cavity complementarily shaped relative to a pointed end of a kayak and allowing engagement of said pointed end therein, said cavity having a non-circular cross-section, said body further including an opposite end portion adapted to project outwardly of said pointed end of the kayak, a stabilizer plane operatively projecting downwardly from said opposite end portion and integrally molded with said body, and a connection removably securing said body to said kayak with said flared end portion in operative engagement over said pointed end of the kayak.

4,167,051
BUOYANT LIFE JACKET

Robert A. Galecke, Mt. Prospect, Ill., assignor to Ero Industries, Inc., Chicago, Ill.

Filed Jan. 19, 1978, Ser. No. 870,607
Int. Cl.[2] B63C 9/08
U.S. Cl. 9—329 1 Claim



1. A buoyant life jacket comprising

(a) a pair of front and side sections each including

(1) a first buoyant front panel having

(a) an inner side edge portion; and

(b) an outer side edge portion;

(2) a second buoyant intermediate front and side panel each including

(a) a front edge portion articulated to the said outer side edge portion of one of the said first buoyant front panels; and

(b) a rear side edge portion;

(3) a third and rear buoyant side panel each including

(a) a lower end portion;

(b) a front edge portion articulated to the said rear edge portion of one of the said second buoyant intermediate front and side panels; and

(c) a rear edge portion;

(4) a flexible open-mesh rear fabric member extending completely across the back of the said buoyant life jacket and including

(a) a lower end portion;

(b) side edge portions articulated to the said rear edge portions of the said third and rear buoyant side panels;

(c) vertically extending slide fastener means releasably fastening the said inner edge portions of the said first buoyant front panels together at the front of said buoyant life jacket;

(5) the said first buoyant front panels having upper portions shaped and cooperating to provide

(a) a neck opening in the said buoyant life jacket;

(6) the said second and buoyant intermediate front and side panels and the said third and rear buoyant side panels having upper end portions shaped and cooperating with each other and with the said flexible open-mesh rear fabric member to provide arm openings in the said buoyant life jacket; and

(7) means including flexible fastening members extending across the said lower end portion of said flexible open-mesh rear fabric member outwardly thereof and having end portions attached to the said lower end portions of the said third and rear buoyant side panels for tightening the said buoyant life jacket about the body of the wearer.

4,167,052

APPARATUS FOR A POINT LASTING MACHINE TO FOLD OVER A SHAFT EDGE OF A SHOE

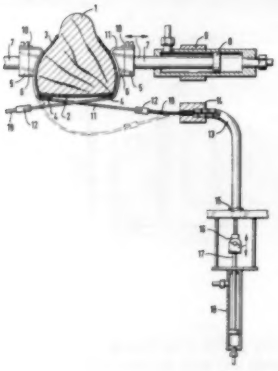
Herbert Schindler, Pirmasens, Fed. Rep. of Germany, assignor to Schon & Cie GmbH Maschinenfabrik, Pirmasens, Fed. Rep. of Germany

Filed Nov. 4, 1977, Ser. No. 848,747

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1976, 2650680

Int. Cl.[2] A43D *21/12*

U.S. Cl. 12—8.1 15 Claims



1. Apparatus for a point lasting machine to fold over an edge of a shaft of a shoe at a ball and joint part of a last of the machine, said apparatus comprising movable presser means for applying pressure against a side surface of the last having the shaft positioned thereon, band means connected to said presser means for folding over the shaft edge against an underside of an insole of the shoe and for holding the shaft edge in its folded position against the insole, said band means extending transversely entirely across an underside of the last from said presser means on one side of the last to an opposite side of the last for positioning against the shaft and the shaft edge, and a tensioning device connected to said band means from the opposite side of the last for tensioning said band means against the shaft and the shaft edge to fold and hold the shaft edge.

4,167,053

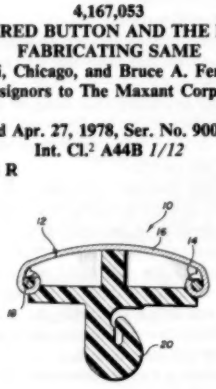
FABRIC-COVERED BUTTON AND THE METHOD FOR FABRICATING SAME

Leo D. Ptasinski, Chicago, and Bruce A. Ferguson, Hinsdale, both of Ill., assignors to The Maxant Corporation, Chicago, Ill.

Filed Apr. 27, 1978, Ser. No. 900,756

Int. Cl.[2] A44B *1/12*

U.S. Cl. 24—113 R 24 Claims



1. A fabric covered button comprising: a locking ring; and a button head having a locking groove for receiving therein said locking ring; said fabric covering said button head and said locking ring said the marginal edge thereof being captivated and retained in and between said locking groove and said locking ring, to thereby secure the fabric to the button.

4,167,054

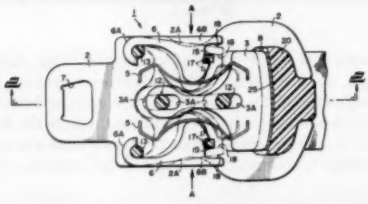
TONGUE PLATE DEVICE FOR USE IN SEAT BELT SYSTEM

Makoto Yamada, Seto, and Eiichi Kinaga, Toyota, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 637,474, Dec. 3, 1975, Pat. No. 4,091,508. This application Sep. 19, 1977, Ser. No. 834,769

Int. Cl.[2] A44B *11/06*

U.S. Cl. 24—171 4 Claims



1. A tongue plate device for use in a seat belt system of the kind using a continuous webbing consisting of a lap belt and a shoulder belt for restraining an occupant onto a seat of a vehicle, comprising a tongue plate having a buckle engaging portion at one end thereof and a webbing passage portion at the other end thereof, a locking plate engaging said webbing at said webbing passage portion of said tongue plate for locking said webbing against passing movement, resilient means for normally urging said locking plate in the locking direction, releasing means for urging said locking plate in the releasing direction thereby unlocking said webbing from the state engaged and locked by said locking plate, said resilient means being a spring unit comprising a pair of leaf springs, which is anchored at one end thereof to said locking plate and at the other end thereof to said tongue plate and which is normally flexed to urge said locking plate in the locking direction by the resilient tendency to return to the original non-flexed state, said releasing means comprising a pair of release levers which can make swinging movement around a pivotal portion thereof relative to said tongue plate, each said release lever engaging the middle portion of the associated one of said leaf springs at the body portion connected to said pivotal portion, and said body portions of said release levers are urged toward each other to increase the flexture of said leaf springs thereby unlocking said webbing from the state locked by said locking plate and establishing the releasing mode.

4,167,055

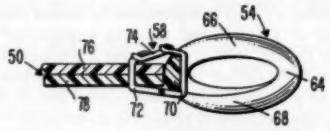
SLIDE FASTENER WITH CROSS ORIENTED POLYMER TAPES

Frank J. Molnar, Meadville, Pa., assignor to Textron Inc., Providence, R.I.

Continuation-in-part of Ser. No. 754,943, Dec. 28, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 845,467

Int. Cl.[2] A44B *19/34*

U.S. Cl. 24—205.16 C 40 Claims



1. A stringer for a slide fastener comprising

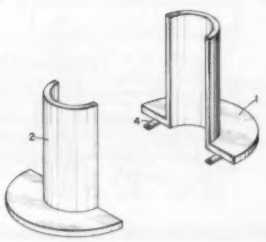
a continuous coupling element having a plurality of head

portions for interlocking with head portions of a mating coupling element,
a carrier tape,
stitching means securing the continuous coupling element to one edge of the carrier tape,
said tape including a pair of superimposed portions through which the stitching means passes,
each of said pair of superimposed portions being a highly oriented polymer film, and
the polymer orientations of said pair of superimposed portions being transverse to each other.

4,167,056
KNOCKOUT EXTRACTING TOOL
William Nattel, Montreal, Canada, assignor to GTE Sylvania Canada Limited, Montreal, Canada
Filed Apr. 27, 1978, Ser. No. 900,630
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—267 3 Claims

1. A tool for extracting a first knockout ring of predetermined dimensions from sheet metal wherein the first knockout ring encircles an opening of predetermined diameter in the sheet metal and for extracting a second knockout ring of predetermined dimensions from sheet metal wherein the second knockout ring encircles a second opening of predetermined diameter larger than the diameter of the first mentioned opening, the tool including
an elongated member;
a first notch in one face of the elongated member adjacent to one end thereof for engaging the first knockout ring at a point along the inner edge of the first knockout ring;
a second notch in the opposite face of the elongated member adjacent to said one end thereof for engaging the first knockout ring at another point along the inner edge of the first knockout ring;
the portion of the elongated member between the first and second notches having dimensions permitting the portion to fit within a diameter of the opening with the first notch engaging the first knockout ring at one point and with the second notch aligned with the first knockout ring at another point diametrically opposite the one point;
the first and second notches both engaging the first knockout ring when the elongated member is displaced laterally from a diameter of the opening;
whereby the first knockout ring may be removed from the sheet metal by pivoting the elongated member back and forth generally along the direction of a line between the points of engagement of the notches with the first knockout ring;
a third notch in said opposite face of the elongated member adjacent to said second notch;
the portion of the elongated member between the first and third notches having dimensions permitting the portion to fit within a diameter of the second opening with the first notch engaging the second knockout ring at one point and with the third notch aligned with the second knockout ring at another point diametrically opposite the one point;
the first and third notches both engaging the second knockout ring when the elongated member is displaced laterally from a diameter of the second opening;
whereby the second knockout ring may be removed from the sheet metal by pivoting the elongated member back and forth generally along the direction of a line between the points of engagement of the first and third notches with the second knockout ring.

4,167,057
DEVICE TO FACILITATE THE REMOVAL OF HOUSED OR BLOCKED BEARING ASSEMBLIES
Craig D. Traynor, R.F.D. #1, West Chazy, N.Y. 12992
Filed Aug. 1, 1977, Ser. No. 820,750
Int. Cl.[2] B25Q *1/00*
U.S. Cl. 29—283 1 Claim

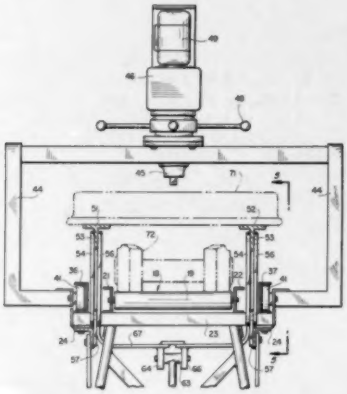


1. A pulling device for removing housed or blocked bearing units from their shaft by transferring the pulling force of a conventional puller directly to the inner race-shaft joint without otherwise engaging the bearing mounting or housing unit, comprising: two half sleeve segments each including an outer peripheral pulling flange for engagement with a conventional puller and an integral inner sleeve for contacting the inner race, and means for locking said half sleeve segments about a shaft including a pair of dowels protruding from an outer surface of the flange of one of said half sleeve segments and a pair of extension arms attached to the flange of the other of the segments, each extension arm including an aperature for cooperating engagement with a dowel on said one half sleeve segment, whereby said segments are locked together on the side of the bearing opposite the conventional pulling unit and the inner sleeve is positioned against the bearing inner race by placing said half sleeve segments on diametrically opposite sides of the shaft and axially sliding the segments along the shaft relative to each other until the dowels are engaged within said apertures, to thereby enable a conventional puller with puller extension arms to be attached to the peripheral pulling flange to provide longitudinal pulling force to the peripheral pulling flange and thus to the inner race of the bearing to be removed to dislodge the bearing at the desired bearing-shaft joint without otherwise contacting the bearing housing or housing support assembly.

4,167,058
CONVEYOR AND SHOE LIFTING ASSEMBLY FOR TRACTOR TRACKS
Harvey W. Janssen, Lafayette, Calif., assignor to Wolff Manufacturing Company, Burlingame, Calif.
Filed Oct. 31, 1977, Ser. No. 847,134
Int. Cl.[2] B23K *1/14*
U.S. Cl. 29—822 5 Claims

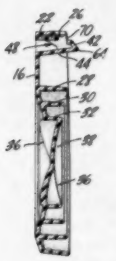
1. A conveyor and shoe lifting assembly for tractor tracks of the type having a chain with a plurality of ground engaging shoes secured thereto comprising: an elongated conveyor assembly for receiving and supporting said tractor track so that it can be moved therealong, support means for supporting said conveyor assembly, a shoe lifting rail disposed on each side of said conveyor assembly and supported by said supporting means, said shoe lifting rails being located to engage the ends of the shoes of said track when the rails are moved from a first

non-engaging position to a second engaging and lifting position and for lowering the shoes into the chain when moved from the second to the first position, means for moving the rails



between the first and second position, an additional pair of rails supported on said support means and a power operated wrench supported by said rails for movement along said conveyor.

4,167,059
DISPOSABLE RAZOR
Clemens A. Iten, 235 Overlook Rd., Staunton, Va. 24401
Filed Apr. 12, 1978, Ser. No. 895,552
Int. Cl.[2] B26B *21/06*
U.S. Cl. 30—32 **10 Claims**



1. A razor of the disposable type including a handle part and a blade carrier, said carrier and handle part being of integral one-piece molded thermoplastic material construction, the handle including

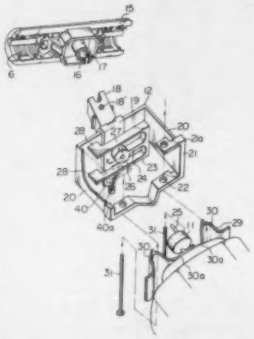
an elongated relatively wide surfaced rear panel, and a skirt encircling the periphery of said rear panel extending frontally therefrom, said panel and its associated skirt extending with diminishing lateral expanse in the direction of one end, the panel and skirt terminus at said one end being disposed transversely of the long axis of the panel, said blade carrier comprising

a blade holder substantially enclosed by said panel and skirt terminus and adjacent said one panel end and extending frontally of said panel, said blade holder being arranged parallel with said panel and skirt one end terminus and including a blade platform, a blade received on said platform, a guard member extending frontally of said blade platform, and means carried on said platform and said skirt one end terminus for maintaining said blade fixed in said holder with its cutting edge in predetermined position relative to said guard,

said means for maintaining said blade fixed in said holder including a plurality of lugs engageable with corresponding notches on said blade,

each of said lugs comprising a first inclined surface, permitting passage of the blade thereover in a first direction, and a second, substantially vertical surface for engaging and locking one of said notches thereby preventing passage of the blade in a second direction, opposite to said first direction, for removal from said blade holder.

4,167,060
ELECTRIC SHAVER
Yoshihiro Sakamoto, Hikone, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Nov. 11, 1977, Ser. No. 850,816
Claims priority, application Japan, Nov. 15, 1976, 51/138896
Int. Cl.[2] B26B *19/02*
U.S. Cl. 30—43.92 **8 Claims**



1. An electric shaver of the type comprising a shaver-body housing, a shaver head case mounted to an outer part of said housing and carrying an outer blade, an inner blade arranged to be reciprocally vibrated while in contact with an inner surface of said outer blade, a vibration member for imparting reciprocal vibratory motion to said inner blade, and rotary motion transmitting means operably connected to said vibration member for delivering drive motion from a motor to said vibration member in the form of rotary motion, the improvement wherein said vibration member comprises:

a driving plate part including a coupling part for supporting said inner blade,

a pair of leg parts including inner and outer ends, the latter supporting said driving plate part,

a mounting base part for connecting said inner ends of said legs to a casing of the motor with said leg parts being flexibly movable only in the directions of said reciprocal vibratory motion of said inner blade, and

a connecting part comprising an arm fixedly connected at one end to an inner surface of said driving plate part, said arm including:

a first portion extending from said fixed end in one of said directions of reciprocal vibratory motion of said inner blade and substantially parallel to said driving plate parts, and

a second portion joined to a free end of said first portion and extending in the other of said directions of reciprocal

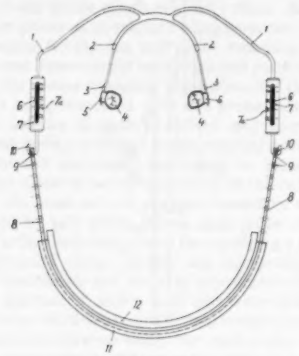
vibratory motion of said inner blade and substantially parallel to said driving plate part, said second portion being operably connected to said transmitting means to receive said rotary drive motion from said transmitting means,

said arm being arranged so as to be flexible relative to said driving plate part only in directions perpendicular to said directions of reciprocal vibratory motion of said inner blade.

4,167,061
ORTHODONTIC APPLIANCE

Rolf Förster, Pforzheim, Fed. Rep. of Germany, assignor to Bernhard Förster, Pforzheim, Fed. Rep. of Germany

Filed Dec. 29, 1976, Ser. No. 755,224
Claims priority, application Fed. Rep. of Germany, May 28, 1976, 2623943; Oct. 28, 1976, 2648989
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—14 D 22 Claims



1. An orthodontic appliance comprising

an oral bow provided on opposite sides with force-applying portions adapted to be connected to teeth to be corrected,

two extra-oral face bow portions joined to said oral bow and having free ends on opposite sides of said oral bow,

a low pull having two terminal portions at opposite ends thereof and at least one slide rail, said terminal portions being disposed on opposite sides of the head of the patient, said slide rail being a projection extending along the length of the low pull,

two resilient elements, each of which is connected between one of said free ends and one of said terminal portions, said resilient elements extending substantially parallel to said force-applying portions when the latter are connected to at least one tooth to be corrected,

tension-adjusting means for changing the effective length of said low pull, and

a guide sleeve through which said low pull extends, said sleeve arranged to engage the nape of the neck of the patient when said low pull is applied,

said slide rail being contained in said guide sleeve, and said low pull contacts said guide sleeve only at said slide rail, so that said low pull will move entirely in unison with the head as it is turned aside and the occurrence of undesirable torques affecting the teeth to be corrected is substantially avoided.

4,167,062
DENTAL HANDPIECE

Joe W. Page, Jr., Huntington Beach, and Paul H. Stahlhuth, Mission Viejo, both of Calif., assignors to Den-Tal-Ez Mfg. Co., West Des Moines, Iowa

Filed Aug. 19, 1977, Ser. No. 825,961
Int. Cl.[2] A61C *1/10, 1/12;* B23B *5/22;* F03B *13/04*
U.S. Cl. 32—26 6 Claims

1. A dental handpiece having a tubular housing with forward and rearward end portions and a motor supported in said housing, comprising:

(a) a burr receiving collet mechanism rotatably supported within said forward portion, including an elongated collet shaft connected at one end in a driven relation with the motor,

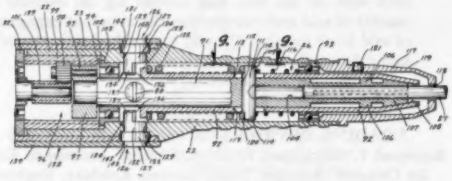
(b) said collet shaft having a plurality of circumferentially spaced and radially yieldable fingers longitudinally extended from the other end thereof,

(c) a collet receiving sleeve telescopically mounted on said collet shaft for relative axial movement,

(d) coacting means on said collet shaft and collet receiving sleeve, responsive to axial movement of the sleeve in one direction to move said yieldable fingers radially inwardly and responsive to axial movement of the sleeve in the opposite direction to permit said fingers to move radially outwardly,

(e) bias means urging the collet receiving sleeve in said one direction,

(f) a cam means supported on the housing for rotation about an axis extended transversely of the housing, said cam



means having a cam surface arranged internally of the housing,

(g) cam follower means on said collet receiving sleeve for moving the collet receiving sleeve in said opposite direction in response to rotation of said cam means,

(h) lever means externally of the housing for actuating said cam means,

(i) said cam means includes a pair of cams spaced transversely of the housing, and

(j) means connecting said lever means to said pair of cams for concurrent actuation,

(k) said pair of cams having like cam surfaces engageable with respective portions of said cam follower means to move the collet sleeve in said opposite direction.

4,167,063
ORTHODONTIC THREADING TOOL

Alan J. Sosnay, 55 E. 9th St., New York, N.Y. 10003

Filed Oct. 17, 1977, Ser. No. 842,629
Int. Cl.[2] A61C *3/00*
U.S. Cl. 32—66 23 Claims

1. An orthodontic threading tool, comprising:

a handle portion (1) having a longitudinal axis;

at least one shank portion (3) extending from an end of said handle portion (1);

a loop portion (4) extending from said shank portion (3) in a direction away from said longitudinal axis of said handle portion;

a threading portion (10) extending from said loop portion (4) in a direction such that at least part of said threading portion (10) is located in close proximity to said longitudinal axis of said handle portion;

said threading portion (10) including a first leg (5) extending from said loop portion and a second leg (6) extending from said first leg, said first and second legs forming a generally "L" shaped arrangement, said threading portion (10) further including a curved or bent area at least at the juncture of said first and second legs defining a camming or bearing surface along which said threading portion (10)

is contact-engageable with an arch wire or the like, said camming or bearing surface being in close proximity to a line extending along said longitudinal axis of said handle portion so that a revolving action of said handle portion substantially about said longitudinal axis thereof imparts a revolving action to said camming or bearing surface about the arch wire or the like; and

a hook member (7) at a free end of said second leg (6) of said threading portion (10) for engaging orthodontic threads or other elongated elements of both the elastic and non-elastic variety and other orthodontic elements such as spring wires, uprighting spring, or the like;

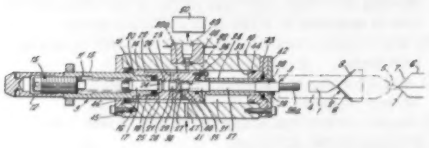
the length of said second leg (6) being such that when said handle portion is revolved about its longitudinal axis and said camming or bearing surface is in engagement with the arch wire or the like, said second leg (6) extends outwardly of said arch wire or the like to permit engagement of said hook member (7) with said orthodontic threads or said other orthodontic elements.

4,167,064

LOADING DEVICES FOR FORM FOLLOWERS

Raymond T. Shackleton, Keighley, England, assignor to Keighley Grinders (Machine Tools) Limited, Keighley, England

Filed May 24, 1978, Ser. No. 908,960
Int. Cl.[2] B24B *53/08, 9/00*; B23D *5/04*
U.S. Cl. 33—23 K **15 Claims**



1. A loading device for use in a form follower, comprising an actuator resiliently loaded in a carrier which slides in a body and forms with that body two chambers for which the carrier constitutes a common piston, one of the chambers communicating with an inlet for connection with a source of hydraulic pressure to urge the carrier in a first direction, the other chamber having a port controlled by a valve movable with the actuator to couple the port alternatively to an outlet for connection with a reservoir of pressure or to said inlet in accordance with movement of the actuator in the first direction or in the opposite direction, respectively, relative to the carrier, the piston having differential surface areas exposed to the two chambers such that when the port is coupled to the inlet and the pressure is the same in the two chambers the carrier is urged in said opposite direction.

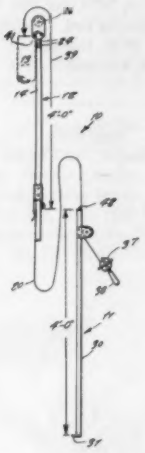
4,167,065

PIPE MEASURING DEVICE

Matt Alaniz, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Mar. 17, 1978, Ser. No. 887,876
Int. Cl.[2] G01B *3/10*
U.S. Cl. 33—137 R **3 Claims**

1. A pipe measuring device, comprising in combination, a foot unit and a head unit for fitting on lower and upper ends of a pipe that is intended to be measured, said head unit comprising an elongated bar member having a lower portion to which the zero end of a steel measuring tape is secured, said tape extending along one side around an upper end of said member and downward therefrom on an opposite side, including a U-shaped cross pin mounted on said member extending transversely across said tape to hold the tape in place against the member, said member including means for engaging the upper end of a pipe, said steel measuring tape extending downward therefrom to said foot unit, and past an upper edge of said foot unit, said foot unit including a bar with a roller mounted thereon spaced from said bar, said tape fitting behind said roller including a terminal lower end of said steel tape having a tape reel attached thereto said foot unit having a sideward



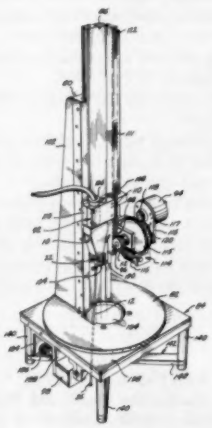
projection at a lower end thereof for fitting under a lower end of said pipe, said lower portion of the head unit including a spacer between the tape and pipe.

4,167,066

AUTOMATIC INSPECTION APPARATUS

Leslie E. Cooper, Kent, and Glenn A. Geitham, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 14, 1978, Ser. No. 896,488
Int. Cl.[2] G01B *7/28*
U.S. Cl. 33—174 P **15 Claims**



1. An inspection system for the evaluation of selected dimensional and geometrical characteristics of an aperture within a production part, said inspection system comprising:

profile sensor means having a displaceable probe means, said profile sensor means for supplying a first electrical signal representative of the displacement of said probe means;

probe manipulator means including a platform having a plurality of downwardly extending legs that are dimensioned and arranged for positioning said platform above an aperture which extends downwardly into a production part with said platform transverse to the axial centerline of

said aperture, said probe manipulator further including a rotatable plate mounted to said platform and a slide assembly extending vertically upward from said rotatable plate, said slide assembly including probe mounting means for affixing said profile sensor means in at least one predetermined position relative to the center of rotation of said rotatable plate, said rotatable plate and said platform including a central opening for passage of said profile sensor probe means, said probe manipulator means further including first drive means for rotating said rotatable plate to move said probe means angularly about the cross-sectional periphery of an aperture being inspected and second drive means for moving said probe mounting means upwardly and downwardly relative to said platform to move said probe means inwardly and outwardly through said aperture being inspected with said probe means contacting the interior boundary wall of said aperture being inspected during at least a predetermined portion of said inwardly and outwardly movement to cause said first electrical signal to be representative of the radial coordinate of the point on said aperture boundary wall that is contacted by said probe means, said probe manipulator means further including means for supplying a second and third electrical signal respectively representative of the angular coordinate and the axial coordinate of said point on said aperture boundary wall that is contacted by said probe means relative to a coordinate system established by the orientation between said probe manipulator means and said aperture being inspected; and,

circuit means for activating said first and second drive means of said probe manipulator means to move said profile sensor probe means through a predetermined scanning sequence in which said probe means traces out a predetermined scanning pattern along said aperture boundary wall, said circuit means including means for receiving said first, second and third electrical signals and for periodically supplying a first spatial coordinate signal representative of the radial dimension of said aperture at a plurality of sampling points along said scanning pattern and second and third coodinate signals representative of the angular and axial position of each of said sampling points.

4,167,067

MEASURING DEVICE FOR MOUNTING CORRECTIVE LENSES IN SPECTACLES RIMS

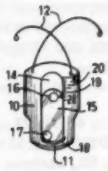
Michel Guiset, Paris, France, assignor to Essilor International, Joinville le Pont, France

Filed Mar. 8, 1978, Ser. No. 884,645

Claims priority, application France, Mar. 15, 1977, 77 07641

Int. Cl.[2] A61B *3/10*

U.S. Cl. 33—200 **2 Claims**



2. A measuring device, to be used when mounting corrective lenses having a progressively varying focal strength, on the grooved rims of a spectacle frame, for checking the compatibility of said lenses with said frame and with the user, and for monocularly measuring the vertical position of the pupils of the user's eyes with respect to the internal lower edge of said rims, said device comprising a nontransparent support having a recess therein, means for removably mounting and maintaining said support in the groove of one of said rims, a reference element vertically movable within said recess, said reference element comprising a flat plate having two spaced coplanar holes therein, the straight line connecting the centers of said holes forming a comparatively small angle with the vertical when said measuring device is in the operating position thereof.

4,167,068

TRANSPORT SYSTEM WITH SWINGING OR VIBRATING BELTS FOR THE DRYING OF LONG PASTA

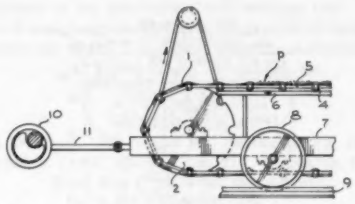
Gino Tomadini, Viale Martelli 4, Pordenone, Italy (33170)

Filed Oct. 4, 1977, Ser. No. 839,305

Claims priority, application Italy, Oct. 18, 1976, 83463 A/76

Int. Cl.[2] F26B *9/00*

U.S. Cl. 34—164 **12 Claims**



1. A system for transporting spaghetti and long pasta laterally during a drying process comprising:

perforated conveying means loosely suspended between opposed end wheels;

means for supporting the conveying means between the end wheels so as to develop a series of transverse depressions for containing the pasta therein;

means coupled to at least one of the end wheels for driving the conveying means; and

means for vibrating the conveying means in a manner such that the pasta transported thereon is arranged in parallel alignment in said depressions and is regularly moved relative to the conveying means and to itself.

4,167,069

DEVICE FOR ASSISTING THE MARKING OF TESTS

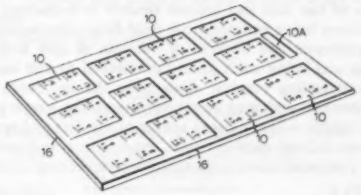
Charles W. Acker, 203 Ava Rd., Toronto 10, Canada

Filed Sep. 12, 1977, Ser. No. 832,592

Claims priority, application United Kingdom, Sep. 20, 1976, 38814/76

Int. Cl.[2] G09B *3/04*

U.S. Cl. 35—9 F **2 Claims**



1. For use with a question, or problem sheet having problems or questions in defined areas on one side of the sheet and answers respectively corresponding to such problems located outside said defined areas,

a mask having apertures shaped and dimensioned so that when the mask overlies said sheet in predetermined registration therewith, the apertures leave said question areas exposed while the mask material occludes the answer areas,

said mask being provided with projections rearwardly extending therefrom located to bear on the edges of said

sheet and ensure the registration of the sheet areas with the mask apertures,

said mask with said projections being arranged, when the mask is located forward side down, to define an open topped receptacle wherein said sheet may be inserted, with said one side down, and moved flatwise toward the mask into registration position.

4,167,070

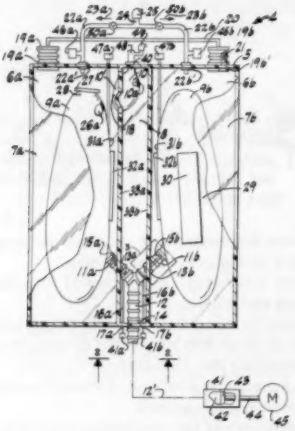
EDUCATIONAL LUNG SIMULATOR

Burt B. Orden, 442 W. 57th St., New York, N.Y. 10009

Filed Oct. 6, 1978, Ser. No. 949,134

Int. Cl.[2] G09B *23/32*

U.S. Cl. 35—17 **12 Claims**



1. An educational lung simulator device comprising in combination: lung chamber means for separately housing separate simulated lungs and for subjecting separate simulated lungs independently to varying gas pressures and degrees of vacuum, and for providing visual observation of separate simulated lungs one within each of separate enclosures of the chamber means; and separate first and second flexible non-resilient enclosure structures each symbolic of said simulated lungs, each forming an enclosure space in fluid flow communication with the other thereof, the first flexible non-resilient enclosure structure being housed within one enclosure and the second flexible non-resilient enclosure structure being housed in another enclosure of said lung chamber means, each enclosure space of the first and second flexible non-resilient enclosure structures being isolated from fluid-flow communication with gas pressures and degrees of vacuum of said lung chamber means and being each jointly connected to and including an interconnecting conduit connecting the enclosure spaces to one-another; and lung respirator means for varying gas pressures within said enclosure spaces of the first and second flexible non-resilient enclosure structures, connected operatively in flow communication with said interconnecting conduit.

4,167,071

GOLF SHOE

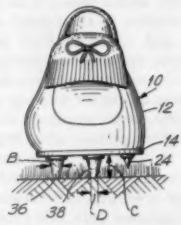
Herbert Koransky, 39 Mechanic St., Somerville, N.J. 08876

Filed Sep. 12, 1977, Ser. No. 832,348

Int. Cl.[2] A43B *5/00*; A43C *15/00*; A63B *69/36*

U.S. Cl. 36—127 **11 Claims**

1. Footwear for a golfer comprising a pair of shoes for the left and right feet of the golfer, each of said shoes including a sole and monolithic spikes depending from said sole, said sole having inner and outer peripheries adjacent which said spikes are located, said spikes having diametral and axial dimensions, all of the spikes on one of said shoes and the spikes adjacent the inner periphery of the other of said shoes having substantially the same diametral and axial dimensions, at least some of the spikes adjacent the outer periphery of said other shoe having at



least one of said dimensions enlarged so as to exceed substantially the corresponding dimension of the spikes on said one shoe and on the inner periphery of said other shoe.

4,167,072

BOOM ARRANGEMENT FOR DRAGLINE

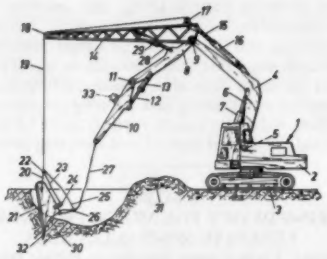
John R. Johansson, Västra Frölunda, Sweden, assignor to Gravmaskinsbolaget John Johansson AB, Västra Frölunda, Sweden

Filed Mar. 3, 1977, Ser. No. 774,189

Claims priority, application Sweden, Mar. 3, 1976, 7602980

Int. Cl.[2] E02F *3/46*

U.S. Cl. 37—116 **10 Claims**



1. An improvement in excavating machines comprising a basic machine, a machine support, boom means mounted on said support for pivotal movement in a vertical plane, a drag bucket supported at the outer end of said boom means by means of a line, and a support arm means pivotally mounted on said boom means, the improvement comprising a second line extending from said drag bucket to the outer end of said support arm means to pull said drag bucket in the direction towards said basic machine.

4,167,073

POINT-OF-SALE DISPLAY MARKER ASSEMBLY

Darl L. Tang, Elmhurst, Ill., assignor to Dynasty Design, Inc., Elmhurst, Ill.

Filed Jul. 14, 1977, Ser. No. 815,545

Int. Cl.[2] G09F *1/00*

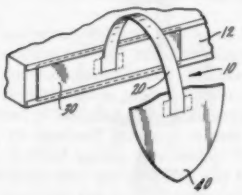
U.S. Cl. 40—124.1 **4 Claims**

1. A point-of-sale display marker assembly comprising:

a base member comprising a thin, flat, relatively resilient sheet having a configuration suitable for attachment to a retain commodity shelf and having two spaced vertical slits cut therein;

a display marker member of three-dimensional configuration, one side of the display marker member comprising a thin, flat attachment element having two spaced vertical slits cut therein;

and an elongated thin, flat, resilient support member having tabs at each end insertable into the slots of the base member and the one side of the display marker member respectively to interconnect the three individual members in a



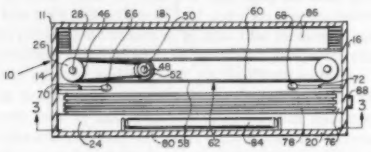
unitary marker assembly, the weight of the display marker member causing the resilient support member to bend forwardly away from the commodity shelf into an inverted catenary shape.

4,167,074

THREE DIMENSIONAL SPACE VIEWING DEVICE

James F. Cardarelli, 117 Reed St., Rockland, Mass. 02370

Continuation-in-part of Ser. No. 721,556, Sep. 8, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,130
Int. Cl.[2] G09F *11/24*
U.S. Cl. 40—438 **1 Claim**



1. A three dimensional viewing device for creating the illusion of space vehicles moving in interplanetary space comprising:

a housing means having a viewing opening in the front surface thereof and a viewing chamber in the interior thereof;

said housing having a base, a plurality of upwardly extending walls, a top, and a chamber therein, one said wall having said large viewing opening therethrough;

a plurality of bearing blocks mounted on said top and said base within said chamber;

a first spindle rod vertically disposed in said chamber, the ends of said first spindle rod journaled in a first pair of said bearing blocks;

a second spindle rod vertically disposed in said chamber, the ends of said second spindle rod journaled in a second pair of said bearing blocks;

a first cylindrically shaped drum member mounted on said first spindle rod;

a first pulley member mounted on said first spindle member;

a second cylindrically shaped drum member mounted on said second member;

an electric motor having a vertically upwardly extending drive shaft, said motor disposed in said chamber;

a second pulley member disposed on said drive shaft;

a V-belt communicating between said first and second pulley members;

a continuous movable black belt member having planetary scenes painted thereon in paints sensitive only to ultraviolet light vertically oriented and disposed toward the rear of said viewing chamber, visible from the front of said chamber, and forming a background scene;

said belt member engaging around said first and said second drum members such that the activation of said electric motor will cause said continuous black belt member to revolve around said drum members providing a continuous background scene in the vertical plane;

at least one foreground picture member in vertical alignment with said background scene vertically mounted in said chamber forward of said continuous black belt, said foreground picture member having cutouts to permit the viewing of said black belt;

ultraviolet light means positioned to illuminate said background black belt;

fluorescent light means positioned to illuminate said foreground picture member;

said foreground picture members are held in vertical alignment with said background scene by a means comprising:

a pair of channel members;

said channel members affixed vertically to opposed interior surfaces of the side walls of said housing; and

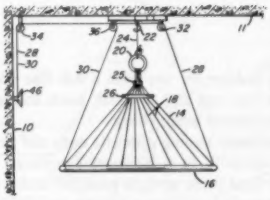
each of said channel members being capable of receiving the outer side edges of said picture members therein.

4,167,075

MEDITATION AID

Robert W. Pugh, 1428 Severn St., Pittsburgh, Pa. 15217, and Bernard A. Frank, 226 S. Aiken Ave., Pittsburgh, Pa. 15206

Filed Sep. 1, 1977, Ser. No. 829,617
Int. Cl.[2] G09F *7/22*
U.S. Cl. 40—617 **10 Claims**



1. A meditation aid comprising:

a frame, the periphery of said frame defining a rigid planar geometric shape;

a plurality of identical flexible means for suspending said frame attached to said frame;

means for separably joining said flexible means at a single point, the periphery of said flexible means defining a three dimensional geometric shape;

means for adjusting said joining means to change the point on said flexible means where said flexible means are separably joined, said adjustment being effected by moving said adjusting means;

means for hanging said flexible means from a super-structure; and

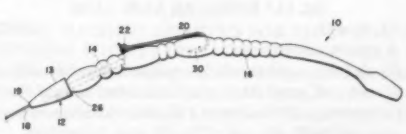
means for raising and lowering said frame.

4,167,076

WORM HEAD FISHING LURE

Charles S. Weaver, 6704 E. 60th Pl., Tulsa, Okla. 74145

Filed Sep. 19, 1977, Ser. No. 834,223
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.2 **4 Claims**



1. A head assembly and flexible plastic molded imitation worm attachable to the end of a fishing line, the combination comprising;

(a) said head, of short length and of a stream-lined shape at its front end;

(b) a tubular stem of selected length and diameter smaller than said head and fixed axially from said front end of said head to a selected distance beyond a back end of said head;

(c) a front end of said worm positioned upon said selected distance of said stem;

(d) said fishing line extending through said stem and said worm to a hook attachable to the end of said fishing line, whereby the point of said hook is insertable at any position in a back end of said worm.

4,167,077

FISHING BOBBER

Clissolde L. Louthan, 9024 NE. Oregon St., Portland, Oreg. 97220

Filed Jan. 25, 1978, Ser. No. 872,068

Int. Cl.[2] A01K *93/00*

U.S. Cl. 43—44.88 **3 Claims**

1. A fishing bobber for use with a fish line connected to a fishing pole at one end and to a fish hook and weight at the other end, said bobber comprising

(a) a buoyant body having opposite ends and being arranged to float normally in a horizontal position and also arranged to float in an upright position under the influence of a downward pull from a fishing weight,

(b) a slot in one end of said body having a widened end arranged to receive the fish line for axial movement in said horizontal position of said body and having a narrowed end for gripping the fish line upon movement into a narrowed portion of said slot,

(c) and guide means on said body arranged to form a guide path for the fish line after it extends from said slot,

(d) said guide means having a portion thereof disposed beyond the narrowed end of said slot whereby the fish line in an upright position of said body is moved into gripping engagement with said slot to stop fish line movement relative to the float but in a horizontal position of said body is released from said slot to allow fish line movement relative to said bobber.

4,167,078

PULL-PIN PINATA

Ramiro M. Oquita, 6014 Chandler Dr., San Diego, Calif. 92117

Continuation-in-part of Ser. No. 758,215, Jan. 10, 1977, Pat. No. 4,092,798, which is a continuation-in-part of Ser. No. 617,602, Sep. 29, 1975, Pat. No. 4,015,364. This application Jan. 31, 1978, Ser. No. 873,804

Int. Cl.[2] B65D *5/36;* **A63H** *33/00*

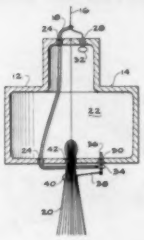
U.S. Cl. 46—11 **15 Claims**

1. A pinata, comprising:

walls defining a substantially enclosed chamber whereby a plurality of small items may be carried in said chamber, comprising a first wall and a second wall cooperating with said first wall;

means for suspending said pinata, and for holding said first wall in releasable assembled relation with said second wall; and

a plurality of lines extending from said pinata when it is suspended, said lines including means for displacing said means whereby said first wall is held relative to said second wall, thereby allowing separation of said walls and releasing said plurality of small items.



4,167,079

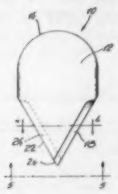
TRIM FENCE

Joseph Reiter, 11255 Suzor Cote, Montreal, Quebec, Canada

Filed Sep. 25, 1978, Ser. No. 945,213

Int. Cl.[2] A01G *1/08*

U.S. Cl. 47—33 **6 Claims**



1. A modular fence member comprising a flat member of predetermined thickness having parallel planar surfaces, the member terminating in a V shaped end with sidewalls forming the V shaped end, each sidewall having intersecting planar side surfaces forming a V including an obtuse angle, the planar side surfaces converging at a linear edge at the apex of the V shaped end and the linear edge has a V shape outline which is in a plane at an angle other than a right angle to the parallel planar surfaces of the member.

4,167,080

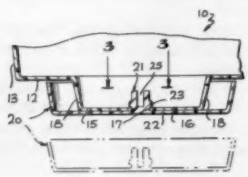
PLANTER HAVING SELF-INDEXING DRAIN DISH

Richard C. Mickelson, 1911 Riverside Dr., Glendale, Calif. 91201

Filed Nov. 11, 1977, Ser. No. 850,689

Int. Cl.[2] A01G *9/02*

U.S. Cl. 47—71 **1 Claim**



1. A plant carrier for holding a growing plant and its life supporting soil comprising:

an enclosure having a bottom and an integral sidewall projecting upwardly and outwardly from the peripheral edge of said bottom wherein said bottom and sidewall define a

cavity occupied by the growing plant and its life supporting soil;

said bottom having an integrally formed, downwardly depending cup-like portion including an annular sidewall and a flat bottom of smaller dimension than said enclosure bottom;

a dish-like tray removably carried on said flat bottom of said cup-like portion having a pre-determined dimension intermediate said dimensions of said enclosure bottom and said cup-like portion bottom so that a uniform upwardly tapering sidewall of said enclosure is maintained;

a plurality of openings provided in said cup-like portion sidewall in fixed spatial relationship from said cup-like portion bottom into said dish-like tray for collection;

combined snap-lock and locator means releasably coupling said tray to said cup-like portion which includes a centrally located hole coaxially disposed on the central vertical axis of said enclosure and an upright vertical projection carried on said cup-like portion bottom for insertion into said centrally located hole whereby said tray is centered and snap-locked together;

said projection includes a plurality of rounded lobes outwardly extending from opposite sides thereof so as to define a space between the underside of each of said lobes and the surface of said tray bottom so as to receive the bottom thickness of said cup-like portion;

said cup-like portion bottom and said dish-like tray bottom having opposing surfaces in abutting contact engagement with each other so that an annular water gathering channel is defined between the opposing surfaces of said dish-like tray sidewall and said cup-like portion sidewall;

said projection consists of at least four elements composed of resilient material so as to provide a yieldable restriction to the edge of said cup-like portion bottom hole;

said projections elements are arranged so as to be fixed at one end to said dish-like tray bottom and cantilevered upwardly at their opposite ends in spatial relationship; and

said tray and said enclosure are of corresponding and identical geometric configuration.

4,167,081

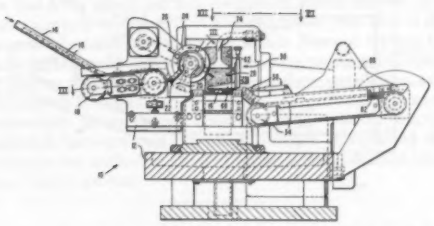
CENTERLESS GRINDER

Anthony R. Marmo, Cheswick, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 7, 1977, Ser. No. 813,563

Int. Cl.² B24B *5/22*

U.S. Cl. 51—103 TF **9 Claims**



1. A centerless grinder for grinding members to a uniform dimension comprising:

a housing;

a grinding wheel mounted on said housing for grinding said members;

a regulator wheel mounted on said housing in opposition to said grinding wheel such that an axis of rotation of said regulator wheel is not parallel to an axis of rotation of said grinding wheel for advancing said members therebetween;

a mounting blade arranged between said grinding wheel and said regulator wheel for supporting said members as said members are ground;

a feed mechanism for advancing said members toward said mounting blade;

an axle;

a feed wheel having radial extensions about its periphery and having a camming surface and being mounted on said axle for advancing said members to said mounting blade; and

an escapement mechanism pivotally mounted around said axle and having a pin mounted therein for following said camming surface, said escapement mechanism diverting said members from said feed mechanism to near said feed wheel where said radial extension contacts an end of said member and advances said member to said mounting blade at a uniform rate.

4,167,082

AUTOMATICALLY CONTROLLABLE PROJECTING CONTOUR GRINDING MACHINES

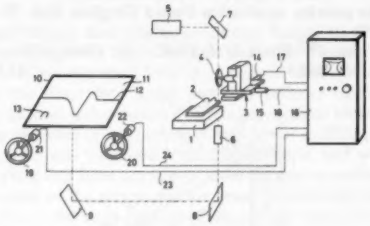
Alfred Kolb, Haus am Tannenberg, 6980 Wertheim am Main, Fed. Rep. of Germany

Filed Nov. 18, 1977, Ser. No. 852,669

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654404

Int. Cl.² B24B *49/12*

U.S. Cl. 51—165.72 **8 Claims**



1. An automatically controllable projecting contour grinding machine comprising a grinding disc, a workpiece supported for contour machining by said grinding disc, cross slide means displacing said grinding disc and said workpiece relative to each other along two mutually perpendicular axes, manual actuator means for displacing said cross slide means along said axes, numerical control means for automatically displacing said cross slide means along said axes, an optical projection device forming on a projection surface a magnified image of said grinding disc and of said workpiece to be machined thereby in accordance with a predetermined contour line, a transparent carrier on said projection surface having said predetermined contour line and a marking in the form of an enlarged outline of the grinding disc, wherein said marking defines a starting position for said grinding disc programmed in said numerical control means for effecting machining of the workpiece along said predetermined contour line by said numerical control means after placing the image of said grinding disc at said marking by way of said manual actuator means.

4,167,083

GRINDING MACHINE ADAPTED FOR CHANGING OF GRINDING WHEELS ON A GRINDING SPINDLE

Sten T. Söderberg, Lidköping, Sweden, assignor to Lidkopings Mekaniska Verkstads Aktiebolag, Lidköping, Sweden

Continuation of Ser. No. 583,975, Jun. 5, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,914

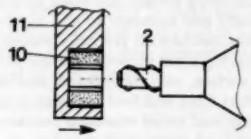
Claims priority, application Sweden, Jun. 7, 1974, 7407501

Int. Cl.² B24B *41/04*

U.S. Cl. 51—168 **12 Claims**

1. Grinding machine adapted for the rapid changing of grinding wheels on a grinding spindle bolt comprising a de-

formable bushing which is provided in a centrally located bore in said grinding wheel and adapted to receive said grinding spindle bolt, said spindle bolt having an external surface provided with at least one ridge helically arranged about said external surface, said ridge having a diameter exceeding the



internal diameter of said bushing, the internal surface of said bushing being without grooves for receiving said ridges whereby said bushing is deformed by said ridges, said helix being pitched sufficiently greatly to enable assembly and disassembly of said wheel on said spindle bolt solely by axially directed forces.

4,167,084

SWIMMING POOL WALL SYSTEM

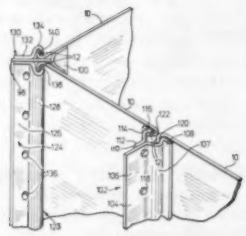
Ernest W. Brunton, 120 St. Margaret's Rd., Ancaster, Ontario, Canada

Filed Oct. 27, 1977, Ser. No. 846,045

Claims priority, application United Kingdom, Oct. 27, 1976, 44726/76

Int. Cl.[2] E04H *3/18*; E04C *1/00*; E04B *2/08*

U.S. Cl. 52—169.7 **11 Claims**



1. A sectional wall comprising, in combination: a plurality of rectangular wall panels each having top and bottom edges and parallel side edges, a longitudinal flange formed along each side edge defining an acute angle with the plane of the panel, whereby said flanges diverge from each other to form an angle with each other when said panels are in alignment with or perpendicular to each other, and an elongated connected defining a pair of opposed converging faces adapted to receive said diverging flanges in abutment whereby said panels are rigidly connected together, said connector comprising a pair of elongated members each having an arcuate section and a planar section whereby said arcuate sections are inwardly concave to form the opposed converging faces upon abutment of said planar sections upon each other for engaging the diverging flanges.

4,167,085

MOUNTING ASSEMBLY FOR GEM BLANKS

Maximo Elbe, Sierksdorf, Fed. Rep. of Germany, assignor to Gerda Magnusson, Sierksdorf, Fed. Rep. of Germany

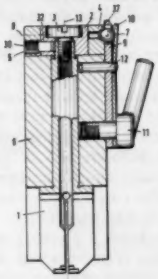
Filed Jul. 7, 1977, Ser. No. 813,660

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1976, 2631236

Int. Cl.[2] B24B *19/00*

U.S. Cl. 51—229 **6 Claims**

1. A mounting assembly particularly for mounting precious stones in a cutting and polishing machine comprising: a chuck with a first and a second end including a plurality of resilient clamping jaws defining at said first end means for seating and clamping a precious stone, said chuck including an inner axial bore extending from said second end to said first end to enable viewing from said second end of a stone seated and clamped in said first end; a dop having said chuck operatively supported therein; indexing means for enabling angular adjustment of said chuck relative to said dop; and inner expanding means adapted



to be inserted into and operatively moved within said bore of said chuck from said second end thereof to effect expansion of said resilient clamping means to enable placement and location of a stone within said seating and clamping means in a position for cutting and polishing thereof; said inner expanding means being removable from within said bore after said stone has been seated and clamped in a desired position to enable checking of the position of said stone by viewing through said bore from said second end of said chuck.

4,167,086

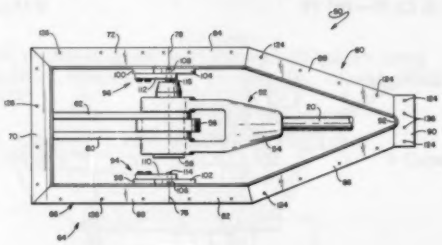
ECCENTRICITY ELIMINATING CABLE-FABRIC CONNECTION APPARATUS FOR AIR SUPPORTED ROOF STRUCTURES

Vernon S. Oase, Toledo, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 23, 1978, Ser. No. 918,225

Int. Cl.[2] E04B *1/345*

U.S. Cl. 52—2 **16 Claims**



1. In a roof structure of a variety wherein a roof membrane is continuously coupled with an upper surface of a fixed support structure peripherally disposed about an area to be enclosed and a plurality of cables are pivotally connected with said support structure at predetermined locations therealong for restraining said membrane, the improved apparatus for providing cable and membrane connections at one of said locations, comprising:

a cable connector assembly including a pivotal component configured for attachment with an end portion of a cable and an anchoring component configured to be structurally fixed to said support structure, said pivotal component

and said anchoring component being further configured for the mutual pivotal coupling thereof to permit pivotal movement of the pivotal component about an axis disposed substantially at the same height as the connection of the membrane to the support structure in the vicinity of the cable; and

a membrane coupling frame including a stationary portion configured to be structurally fixed to said support structure and to provide spaced pivot components situated at opposite sides of said cable connector assembly, said pivot components defining a common pivot axis substantially collinear with the axis of pivotal movement of the pivotal component of the cable connector assembly, and a pivotal portion hingedly coupled with said stationary portion at said spaced pivot components, having a periphery extending continuously about the pivotal component of said cable connector assembly and configured for corresponding continuous attachment with said membrane at said predetermined location.

4,167,087

NUCLEAR REACTOR INSTALLATION IN UNDERGROUND CONSTRUCTION

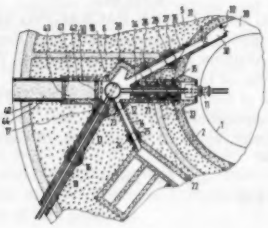
Hans-Peter Schabert, and Erich Strickroth, both of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,350

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634355

Int. Cl.[2] E02D *27/00*

U.S. Cl. 52—169.6 **20 Claims**



1. Nuclear reactor installation in underground construction having a tunnel extending from a location at the surface of the earth to an underground concrete tank comprising an auxiliary tunnel extending from a branching location of the first-mentioned tunnel to a location at the surface of the earth different than that from which the first-mentioned tunnel extends, said auxiliary tunnel having a cross section smaller than that of the first-mentioned tunnel and having means disposed therein for blocking said auxiliary tunnel, said blocking means being openable during operation of the nuclear reactor installation, said first-mentioned tunnel being substantially rectilinear and being continuously closed during operation of the nuclear reactor installation between said branching location thereof and the location at the surface of the earth from which said first-mentioned tunnel extends.

4,167,088

DOORS FOR PATIOS AND THE LIKE

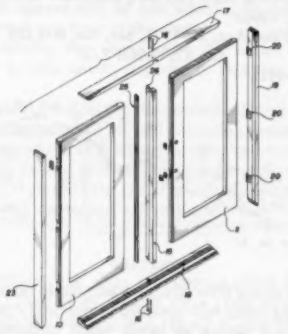
Bernard C. Governale, Duluth, Ga., assignor to Peachtree Doors, Inc., Duluth, Ga.

Filed Jul. 6, 1978, Ser. No. 922,345

Int. Cl.[2] E06B *1/04*

U.S. Cl. 52—207 **3 Claims**

1. A door structure for patios and the like comprising at least one fixed and one hinged door panel in side-by-side relationship in a common vertical plane, a center mullion extending from top to bottom of said door panels and having a portion thereof projecting between said fixed and hinged door panels, a hinge jamb for said hinged door panel extending from top to bottom thereof, said center mullion constituting a strike member for said hinged door panel, a jamb for the edge of the fixed door panel away from said center mullion, and a metal stiffener for said center mullion extending from top to bottom thereof and being connected with the center mullion and with a stile of said fixed door panel and locking the fixed door panel rigidly to the center mullion, said metal stiffener comprising a unitary member of uniform cross section and being generally L-shaped in cross section and lapping to substantially right angular faces on the portion of the center mullion projecting between said



fixed and hinged door panels, projecting flanges on said stiffener extending from top to bottom thereof at one side of the center mullion and being lockingly engaged with the adjacent stile of the fixed door panel, and said stiffener additionally having an inset web between said flanges engaged lockingly in a recess provided in said portion of said center mullion projecting between said fixed and hinged door panels, said web and recess extending from top to bottom of the center mullion, and said portion of the center mullion being of reduced thickness compared to the body portion of the mullion lying forwardly of the fixed and hinged door panels.

4,167,089

PANEL ASSEMBLY AND A PANEL ELEMENT FOR A PANEL ASSEMBLY

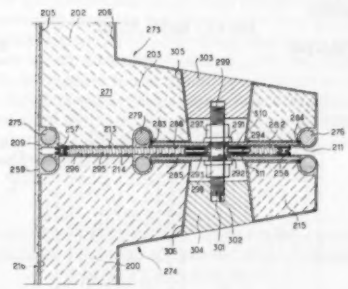
Raymond F. E. Camus, 27, avenue Foch, 75016 Paris, France

Filed Jan. 4, 1978, Ser. No. 866,943

Claims priority, application France, Jan. 10, 1977, 77 00520

Int. Cl.[2] E04C *2/22*

U.S. Cl. 52—309.7 **11 Claims**



1. A panel assembly comprising a plurality of rimmed rectangular panel elements in juxtaposed relation with rims of juxtaposed panel elements facing each other, each said panel element comprising a core of hard, aerated material, a fiber reinforced covering enveloping said core, and reinforcement

rods embedded in fiber reinforced resin in continuity with said covering for bonding said reinforcement members to both said core and said covering, an apertured reinforcing plate interconnecting adjacent reinforcement members by being welded thereto, reinforcing plates of juxtaposed panel elements facing each other with their apertures in registry, and an assembly bolt passing through said apertures in registry for clamping said reinforcing plates together to form an assembly joint.

4,167,090

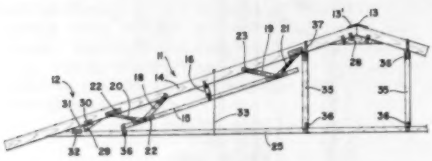
KNOCK-DOWN TRUSS STRUCTURE

Arthur C. Sanford, 2308 Bay Dr., Hillsboro Shores, Pompano Beach, Fla. 33062

Filed Apr. 26, 1978, Ser. No. 900,180

Int. Cl.[2] E04B *1/32*

U.S. Cl. 52—641 **6 Claims**



1. A knock-down truss structure adapted to be supported on spaced bearing walls and comprising opposed composite rafters; each rafter having an upper wood compression chord member, a lower wood tension chord member laterally spaced therefrom, and web members interconnecting said upper and lower chord members; said opposed rafters each having a heel portion adapted to be supported from said spaced bearing walls and converging upwardly therefrom; means detachably joining the upper ends of said rafters; a tie member detachably interconnecting the heel portions of said opposed rafters; interabutting blocks secured to the tie member and the heel portions of the rafters for resisting the outwardly directed thrust applied to the rafters, and at least one suspension web member detachably interconnecting each rafter with said tie member; whereby said rafters can be knocked down into close parallelism with said tie member.

4,167,091

CHUTE FILLING DEVICE FOR FILTER CIGARETTE CASINGS

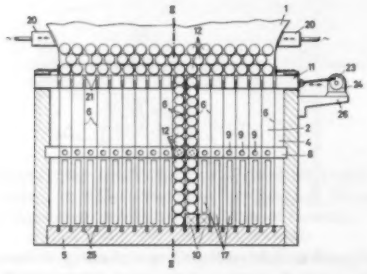
Heinrich W. Ruppert; Klaus Glitschmann, and Hans Haller, all of Trossingen, Fed. Rep. of Germany, assignors to Efka-Werke Fritz Kiehn GmbH, Trossingen, Fed. Rep. of Germany

Continuation of Ser. No. 651,784, Jan. 23, 1976, abandoned. This application Apr. 15, 1977, Ser. No. 788,027

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1975, 2545891

Int. Cl.[2] B65B *35/30*

U.S. Cl. 53—149 **8 Claims**



1. In a chute filling device for use solely with cigarette tubes empty of tobacco and having respective filters on one end thereof, the device including a funnel and a chute divided by partitions with a discharge opening and a pushing ram, the improvement comprising:

means for loosely suspending said partitions with substantially uniform play throughout their lengths, said means for suspending including a first plurality of slits of substantially uniform width along their lengths and depths in a plate defining a floor of the device and a second plurality of slits of substantially uniform width along their lengths and depths in a swing frame, one end of each of said partitions being placed in a respective one of said slits of uniform width in said plate and the other end of each of said partitions being placed in a respective one of said slits of uniform width in said swing frame, said uniform width of each of said slits being greater than the thickness of the respective end of that partition positioned therein, and

means to vibrate said partitions to impart lateral movements of adjacent ones of said partitions toward and away from one another so that the cigarette tubes empty of tobacco and having the respective filters at ends thereof are braked in their downward fall after each action of the pushing ram by frequent contact with slides of said partitions which vibrate with lateral motion towards and away from adjacent ones thereof in said slits of substantially uniform widths, the tubes moving downwardly while maintaining a substantially horizontal position as a result of the braking action.

4,167,092

SEALING DEVICE FOR PACKAGING MACHINE

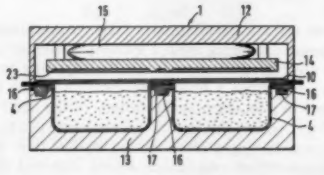
Emmerich Medwed, Wolfertschwenden, Fed. Rep. of Germany, assignor to Multivac Sepp Haggenmuller KG, Wolfertschwenden, Fed. Rep. of Germany

Continuation of Ser. No. 770,545, Feb. 22, 1977, abandoned. This application May 2, 1978, Ser. No. 902,028

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1976, 2606434

Int. Cl.[2] B65B *51/14*

U.S. Cl. 53—373 **6 Claims**



1. A sealing device for sealing together two webs of packaging material, comprising:

a sealing tool; and

a sealing backing;

said sealing tool and said sealing backing being arranged for relative reciprocating movement for sealing said webs therebetween;

said sealing backing including a resilient contacting surface facing said sealing tool;

said sealing tool including a sealing surface facing said contacting surface of said sealing backing; and

said contacting surface being formed of protrusions or depressions, and said sealing surface having a substantially smooth structure;

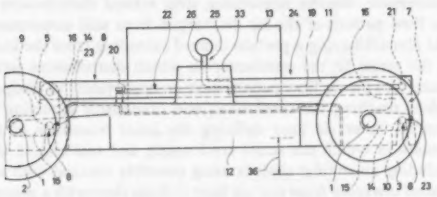
whereby as a result of the operative cooperation developed between said protrusions or depressions and said substantially smooth structure, adherence of said packaging material to said contacting surface is avoided.

4,167,093

LAWN MOWER

Rainer Pfeiffer, Stuttgart-Feuerbach; Udo Baasner, Hemmingen, and Fritz Hugendubel, Stuttgart, all of Fed. Rep. of Germany, assignors to Fritz Roth KG, Stuttgart-Feuerbach, Fed. Rep. of Germany

Filed Jan. 27, 1977, Ser. No. 762,964
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1976, 2604609
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—17.2 18 Claims



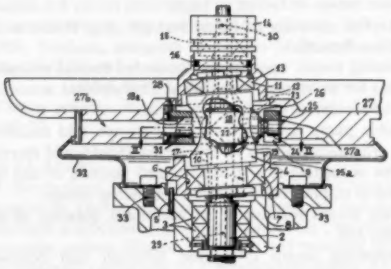
1. A lawn mower, comprising a plurality of wheels each having a shaft; housing means carrying a cutting element and drive means for driving the latter, said housing means being connected to said shafts movable relative to the same so as to change the distance between said housing means and said shafts to thereby correspondingly change the cutting height of said cutting element; an adjusting member movable between a plurality of positions and arranged to arrest said housing means in each of said positions to thereby adjust said distance between said housing means and said shafts; and one spring which connects said housing means with at least one of said shafts and is simultaneously engageable with said adjusting member so that said one spring simultaneously performs two functions one of which is to substantially counteract the weight of said housing means, said drive means and said cutting element so as to aid a user in upwardly adjusting said cutting height, and the other of which is to resiliently bias said adjusting member to said positions so as to retain said adjusting member in each of said positions.

4,167,094

SPINDLES FOR TWISTING MACHINES

Jacques Verdollin, Saint Andre de Corcy, France, assignor to Verdol S.A., Caluire, France

Filed Apr. 25, 1978, Ser. No. 899,947
Claims priority, application France, Apr. 28, 1977, 77 14141
Int. Cl.[2] D01H *7/86*
U.S. Cl. 57—58.72 6 Claims



1. An improved double-twist spindle mechanism of the type having a shaft rotatably supported in a fixed body, and the shaft supporting a thread bobbin carrier rotatably mounted on the top thereof, and the shaft having a hollow axial thread-receiving bore communicating with a radial thread exit bore in the shaft below the bobbin, the mechanism comprising:

means connected to the thread bobbin carrier for supporting an upper bearing, and means carried by the fixed body supporting a lower bearing, the bearings surrounding the shaft respectively above and below said thread exit bore, and the bearings being mutually aligned along a whorl axis which is disposed at an acute angle to the axis of the shaft;

an annular whorl member surrounding the shaft and supported at its ends by said upper and lower bearings, the whorl member having a passageway extending therethrough transversely of said whorl axis and opposite to said thread exit bore of the shaft;

a thread driving disc surrounding the whorl member and having a radial cavity opposite to said thread exit bore; and

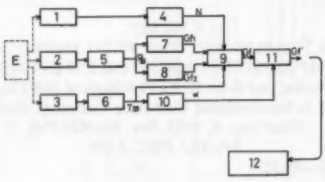
a flange plate fixed to the disc outside the whorl member, and having a central portion extending inwardly through the passageway of the whorl member and mounted on the shaft, the central portion supporting the disc for rotation with the shaft with the radial cavity of the disc communicating with the thread exit of the shaft.

4,167,095

METHOD OF AND AN APPARATUS FOR CONTROLLING FUEL FLOW IN A ONE SPOOL TYPE GAS TURBINE WITH A HEAT EXCHANGER

Daiki Fukuda, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 20, 1977, Ser. No. 835,020
Claims priority, application Japan, May 18, 1977, 52/57338
Int. Cl.[2] F02C *7/22, 9/04*
U.S. Cl. 60—39.03 10 Claims



1. A method of controlling fuel flow in a one spool type gas turbine with a heat exchanger, particularly applicable during the start-up or acceleration of turbine operation, said method comprising the steps of detecting as electric signals the speed of rotation of the gas turbine, temperature at a portion of the gas turbine and compressed air pressure at a portion of the gas turbine; obtaining a starting fuel flow signal Gf_1 and an accelerating fuel flow signal Gf_2 by performing separate operations of the pressure signal; alternatively selecting the fuel flow signal Gf_1 or Gf_2 in response to the turbine speed signal to obtain a reference fuel flow signal Gf corresponding to the selected fuel signal; and transmitting to the gas turbine the reference fuel flow signal Gf after it is compensated by a fuel flow restriction coefficient determined by the temperature signal.

4,167,096

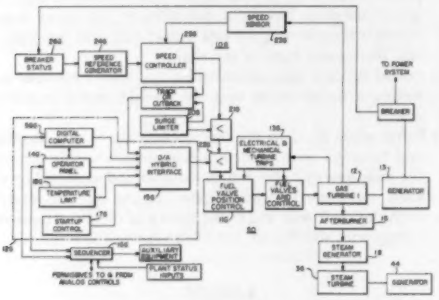
COMBINED CYCLE ELECTRIC POWER PLANT AND A GAS TURBINE HAVING AN IMPROVED OVERSPEED PROTECTION SYSTEM

Jack R. Smith, Pittsburgh, and Terry J. Reed, North Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 8, 1974, Ser. No. 495,739
Int. Cl.[2] F02C *9/04*
U.S. Cl. 60—39.28 R 4 Claims

1. A control system for an electric power plant gas turbine comprising means for generating an electric fuel reference

signal to control the turbine speed and load, means for controlling the position of a throttle valve to control the flow of fuel to said gas turbine in response to the fuel reference signal from said speed and load controlling means, means for generating an electric signal representative of the turbine speed, means for generating an electric fuel limit signal in response to the speed signal to limit the turbine speed to a predetermined reference value, means for directly coupling the fuel limit signal to said throttle valve position control means to provide relatively fast



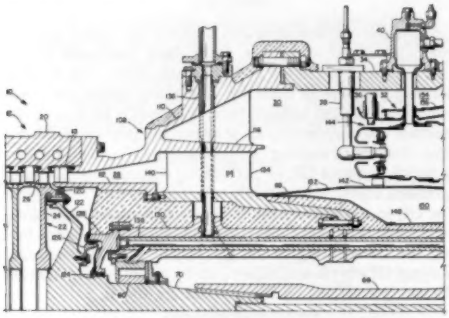
turbine overspeed protection, means for sensing the status of a breaker associated with the electric plant, and means for generating a first reference signal corresponding to a first speed value when the plant breaker is open and for generating a second reference signal corresponding to a second reference speed value when the plant breaker is closed, said electric fuel limit signal generating means responding to the difference between the speed signal and the generated speed reference signal.

4,167,097

GAS TURBINE ENGINES WITH IMPROVED COMPRESSOR-COMBUSTOR INTERFACES

Leon R. Wosika, and John G. Vawter, both of San Diego, Calif., assignors to International Harvester Company, Chicago, Ill.

Filed Sep. 9, 1977, Ser. No. 831,970
Int. Cl.[2] F02C *3/04*
U.S. Cl. 60—39.31 **4 Claims**



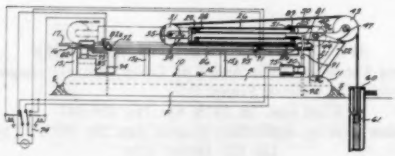
1. A gas turbine engine comprising: an axial flow compressor which discharges the fluid compressed therein along a path that is concentric with the axial centerline of the engine; an annular combustor located downstream from and axially aligned with said compressor; a turbine having a rotor with at least one bladed stage, said turbine being in fluid communication with the downstream end of said combustor; and an interface between the discharge side of said compressor and the upstream end of the combustor which comprises: a diverging annular diffuser disposed immediately downstream from and in axial alignment with said compressor, said annular diffuser having an inlet communicating with the discharge side of the compressor and an outlet downstream therefrom which has a larger cross-sectional area than said inlet; an annular plenum disposed upstream from said combustor in axial alignment with said diffuser and in fluid communication with the outlet of said diffuser, said plenum having an outlet communicating with said annular combustor at the upstream end thereof and a larger cross-sectional area than said diffuser outlet whereby air dumped into said plenum through said diffuser outlet will undergo a reduction in velocity; and radially oriented struts located in said plenum, said struts having an airfoil section and the leading edges of said struts facing the discharge side of the compressor, thereby minimizing strut related disturbances in the flow pattern of the air discharged from said compressor; said plenum having a portion thereof extending from the locus of the struts to the combustor in which distrubances introduced into the air flow pattern have an opportunity to dissipate before reaching the combustor; said combustor including an annular, inner air liner defining the inner boundary of the plenum in which the struts are located; and said engine also including an annular shaft housing assembly co-axial with and spaced inwardly from said air liner to form therewith a passage communicating at its downstream end with said bladed stage of the turbine rotor, there being openings in said inner air liner through which compressor discharge air can bleed from the plenum into said passage for delivery to said bladed rotor stage to cool the latter.

4,167,098

HORIZONTAL PUMPING UNIT

Robert G. James, 3509 Janene Way, Bakersfield, Calif. 93306

Filed Oct. 17, 1977, Ser. No. 842,583
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—369 **12 Claims**



1. Apparatus for providing articulating motion, comprising:

container means including an impervious cavity for containing a first quantity of liquid and gas at pressure in the interior thereof;

articulating means operatively connected to said container means for producing mechanical displacement according to the receipt of said liquid therein;

reversible pump means connected between said container and articulating means for transferring said liquid therebetween according to a predetermined position of said mechanical displacement of said articulating means;

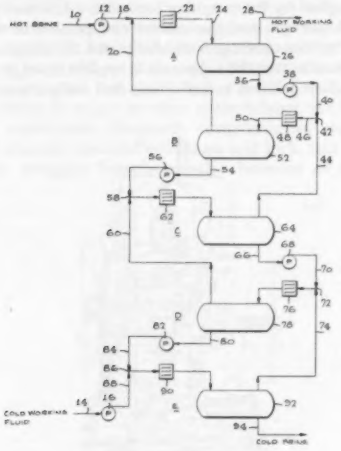
reservoir means for storing an additional quantity of said liquid; and

compensating means connected between said reservoir means and said container means and aligned to engage said articulating means at a preselected position of said mechanical displacement for transferring said liquid between said container and reservoir means according to the exceedance of said mechanical displacement relative said preselected position.

4,167,099
COUNTERCURRENT DIRECT CONTACT HEAT EXCHANGE PROCESS AND SYSTEM

Edward F. Wahl, III, Claremont, and Frederic B. Boucher, San Juan Capistrano, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Jan. 30, 1978, Ser. No. 873,264
Int. Cl.[2] F03G *7/00*
U.S. Cl. 60—641 **27 Claims**



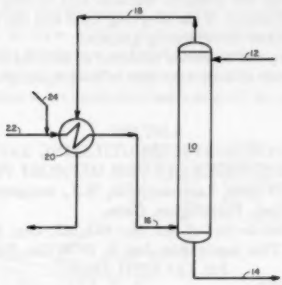
1. A process for recovery of energy from hot water containing fluid including geothermal brine and other hot water containing sources, which comprises passing said hot water containing fluid into direct contact heat exchange relation with an immiscible working fluid in a plurality of separate stages, including in each stage intimately mixing said hot water containing fluid with said working fluid, settling said mixture in a settling zone and separating said mixture into a hot water containing fluid phase and a working fluid phase, introducing said hot water containing fluid into one end stage of said plurality of separate stages and introducing cold working fluid into the opposite end stage, whereby said hot water containing fluid and said working fluid flow in countercurrent relation through said stages and said working fluid is heated in increments by said hot water containing fluid to raise the temperature of said working fluid, and withdrawing and extracting energy from said hot working fluid.

4,167,100
METHOD FOR REMOVING WATER-SOLUBLE INORGANIC SALTS AND ICE FROM HEAT EXCHANGE SURFACES

Richard G. Winter, Ponca City, Okla., and John H. A. Ramage, Fife, Scotland, assignors to Conoco Methanation Company, Stamford, Conn.

Filed Nov. 2, 1977, Ser. No. 847,981
Claims priority, application United Kingdom, Apr. 4, 1977, 14148/77
Int. Cl.[2] F25D *21/12, 21/10*
U.S. Cl. 62—82 **3 Claims**

1. In a method for removing hydrogen sulfide, organic sulfur compounds, carbon dioxide, water, ammonia and hydrocarbons from a synthesis gas stream comprising primarily carbon monoxide, carbon dioxide, hydrogen and methane by cooling said synthesis gas stream to a temperature below 32° F. in a heat exchange zone and thereafter contacting said synthesis gas stream with methanol at a temperature below about −40° F. in a methanol contacting zone to remove said hydrogen sulfide, organic sulfur compounds, carbon dioxide, water, ammonia and hydrocarbons, the improvement comprising flushing the heat exchange surfaces in said heat exchange zone with a methanol-water mixture containing from 20 to 70

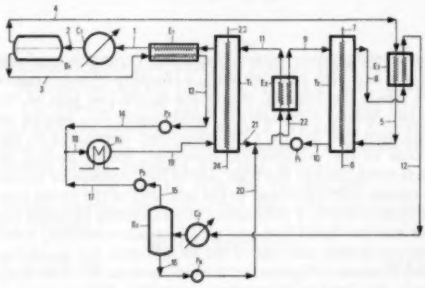


weight percent methanol to remove ice and water-soluble inorganic salts from said heat exchange surfaces.

4,167,101
ABSORPTION PROCESS FOR HEAT CONVERSION

Alexandre Rojey, Vanves, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation of Ser. No. 711,826, Aug. 5, 1976, abandoned. This application May 22, 1978, Ser. No. 908,431
Claims priority, application France, Aug. 14, 1975, 75 25598
Int. Cl.[2] F25B *15/00*
U.S. Cl. 62—102 **22 Claims**



1. A process for producing heat at a temperature A from a heat source available at a temperature B, the temperature A being above the temperature B, comprising the steps of:

(a) contacting a gaseous fraction (G) of a working fluid as defined in step (d) with a liquid phase solvent as defined in step (e), in an absorption zone to absorb at least a portion of the gaseous fraction in the solvent so as to obtain a solution of the working fluid in the solvent and to evolve heat, and transferring at least a portion of the evolved heat at temperature A to an external heat receiving medium;

(b) passing the resultant solution from step (a) to a stripping zone and contacting it with a stripping gas (H) as defined in step (d) so as to desorb at least a portion of said gaseous fraction of the working fluid and to obtain (i) a gaseous mixture of said gaseous fraction of the working fluid with said stripping gas and (ii) a desorbed solution, and compensating for the endothermal heat of desorption by indirectly transferring said heat available at the temperature B to the stripping zone;

(c) subjecting the resultant gaseous mixture from step (b) to: (i) at least partial liquefaction by indirect heat exchange contact with an external cooling medium; (ii) phase separation; and (iii) vaporization of resultant liquid; in order to obtain at least two separate gaseous fractions, a gaseous

fraction (G) of the working fluid and a stripping gas (H), said vaporization being conducted by indirect heat transfer against said heat available at the temperature B;

(d) recycling the gaseous fraction (G) to step (a) as said gaseous fraction of the working fluid and the fraction (H) to step (b) as the stripping gas; and

(e) recycling the desorbed solution of step (b) to step (a) to reconstitute at least a portion of said liquid phase solvent.

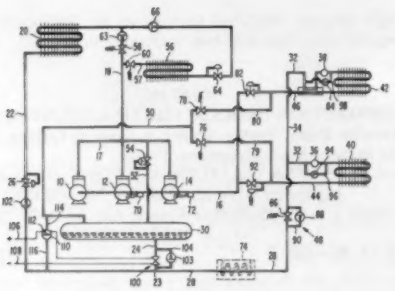
4,167,102
REFRIGERATION SYSTEM UTILIZING SATURATED GASEOUS REFRIGERANT FOR DEFROST PURPOSES

Benjamin R. Willitts, Lawrenceville, N.J., assignor to Emhart Industries, Inc., Farmington, Conn.

Continuation-in-part of Ser. No. 644,263, Dec. 24, 1975, abandoned. This application Jan. 9, 1978, Ser. No. 868,089

Int. Cl.[2] F25D *21/00*

U.S. Cl. 62—152 **9 Claims**



1. In a refrigeration system including compressor means having low and high pressure sides, a plurality of evaporators each of which has one end connected to the low side of the compressor means, a refrigerant liquid supply line having an inlet end, said line having a discharge end connected to the other ends of the evaporators, condenser means having an input side connected to the high side of the compressor means and an output side connected to the inlet end of the liquid line, a surge-type receiver, a connecting line extending between the receiver and the liquid line, and a defrost line extending from the receiver to said one end of the evaporators for supplying saturated gaseous refrigerant to the evaporators for defrosting the same, the improvement that comprises defrost control means for permitting flow in both directions through said connecting line in the presence of a predetermined pressure balance as between the receiver and liquid line, and for preventing flow at least in a direction from the liquid line to the receiver, responsive to the appearance therebetween of a pressure imbalance in which the liquid line exceeds, by a predetermined differential value, the pressure within the receiver.

4,167,103
MACHINE FOR ROUGHING THE MARGIN OF AN UPPER OF A SHOE ASSEMBLY

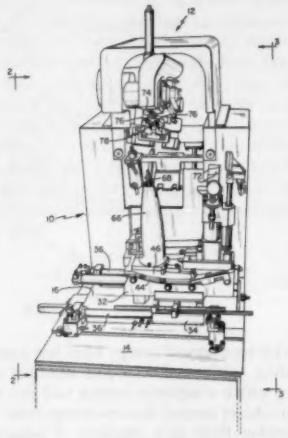
Michael M. Becka, Nashua, N.H., assignor to International Shoe Machine Corporation, Nashua, N.H.

Filed Jul. 21, 1978, Ser. No. 926,673

Int. Cl.[2] C14B *1/44;* **A43D** *0/00*

U.S. Cl. 69—6.5 **3 Claims**

1. A machine for roughing the margin of an upper of a shoe assembly, said shoe assembly comprising a last having an insole located on its bottom and the upper mounted thereon with the margin of the upper being secured to the bottom of the insole so that the margin and the insole form the bottom of the shoe assembly, said shoe asembly bottom having spaced substantially planar end portions consisting of a heel seat portion and a forepart portion and a substantially planar shank portion between the two end portions, said three planar portions lying in different planes, comprising: a support, for supporting the shoe assembly bottom-up, mounted for rocking movement through an upwardly concave arc; a roughing tool located above the shoe assembly; means for yieldably urging the roughing tool downwardly against the shoe assembly; and means for so moving the shoe assembly support and means for so adjusting the position of the roughing tool that the upper margin from one end of the shoe assembly bottom to the other end of the shoe assembly bottom moves past the roughing tool and is roughed by the roughing tool with a first end portion, said shank portion, and the second end portion of the shoe assembly bottom moving successively past the roughing tool; characterized in that the support is moveable through said arc between a first position in which said first end portion lies in a



substantially horizontal plane, a second position in which said shank portion lies in a substantially horizontal plane, and a third position in which said second end portion lies in a substantially horizontal plane; and characterized in that the machine comprises; means for initially retaining the support in said first position; means effective pursuant to said support movement when the juncture between said first end portion and the shank portion is in registration with the roughing tool to move the support from said first position to said second position; and means effective pursuant to said support movement when the juncture between said shank portion and said second end portion is in registration with the roughing tool to move the support from said second position to said third position.

4,167,104
SOLENOID ENABLED LOCK FOR VENDING MACHINES AND THE LIKE

Charles E. Bond, Goshen, Ohio, assignor to Coca-Cola Bottling Works Company, Cincinnati, Ohio, a part interest

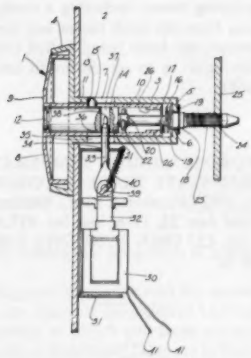
Filed Nov. 21, 1977, Ser. No. 853,251

Int. Cl.[2] E05B *47/00*

U.S. Cl. 70—208 **4 Claims**

1. In a draw lock for securing a cabinet door to a cabinet comprising a hollow cylindrical lock housing non-rotatably secured to the door terminating at its forward end in a shallow rectangular handle receiving recess, said cylindrical housing containing an aperture extending therethrough for accepting a latch bolt, a retractable and extensible T-shaped member having a forward handle portion slidably received in said recess and a hollow tubular rearward portion slidably and rotatably received in said housing, said T-shaped member being movable between a retracted position wherein said handle portion is slidably received within said recess and an extended portion

wherein said handle portion is projected outwardly from said recess, said T-shaped member including a lock cylinder received therein, the forward end of the said cylinder containing keyway means adjacent said handle portion for receiving a key, said cylinder including a latch bolt projecting outwardly therefrom through said hollow tubular rearward portion of said T-shaped member and adapted to engage said aperture in said housing when said T-shaped member is in said retracted position, said latch bolt being disengagable from said aperture to permit said T-shaped member to move from said retracted position to said extended position, means to urge said T-shaped member outwardly from said housing when said latch bolt is disengaged from said aperture, and a threaded draw member associated with said T-shaped member for threadedly engaging the cabinet to secure the door to the cabinet, the improvement in combination therewith comprising an electrically operated solenoid mounted proximate said lock, said solenoid having an armature linearly movable between an extended



position when said solenoid is deenergized and a retracted position when said solenoid is energized, coaxial apertures extending through one side at least of said housing, said lock cylinder and said hollow tubular rearward portion of said T-shaped member, a dead bolt having a lock engaging end and a driven end pivotally connected to said armature so that said dead bolt is driven in a direction substantially parallel to the direction of travel of said solenoid armature but with the ability to pivot slightly with respect to said armature to compensate for minor misalignments between said dead bolt and said coaxial apertures, said lock engaging end being withdrawn from said coaxial apertures when said solenoid is energized and extended through said coaxial apertures into said lock cylinder when said solenoid is deenergized to prevent relative movement between said housing and said T-shaped member, and spring means attached to said dead bolt tending to urge said lock engaging end of said dead bolt toward said coaxial apertures.

4,167,105

TANDEM MILL DRIVE CONTROL SYSTEM

Thomas E. Harris, Pointe Claire, Canada, assignor to Dominion Engineering Works Limited, Canada

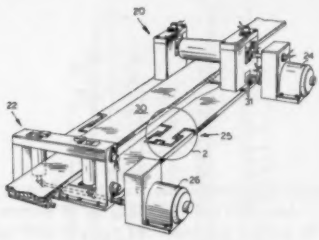
Filed Aug. 29, 1977, Ser. No. 828,371
Claims priority, application Canada, Sep. 29, 1976, 262269
Int. Cl.[2] B21B *36/06*
U.S. Cl. 72—19 **7 Claims**

1. In a rolling mill having a first roll stand and a second roll stand positioned adjacent thereto along the path of a workpiece to receive in operation a substantially rigid workpiece, the improvements comprising:

force linkage means connected between said first and said second stands extending generally parallel with and spaced from said pass line,

load measuring sensor means arranged with said linkage means to be responsive to changes in loads transferred by said workpiece,

the relationship of said workpiece, said first and said second stands, said linkage means and said second means being such as to form a rigid force transmitting network between said workpiece and said sensor means, in which said linkage means, said first and said second stands, and said sensor means are immobile with respect to each other,



said sensor means having as output an electrical signal,

signal transmitting conductor means connecting said sensor output to motor control means,

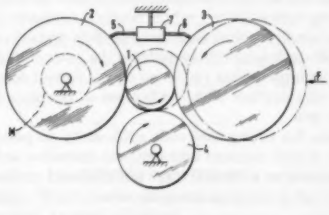
said motor control means controlling the loading of at least one motor driving one said stand being responsive to said control signal to vary said motor loading relative to the motor loading of other said stand in the sense as to diminish said load transferred by said workpiece.

4,167,106

METHOD AND APPARATUS FOR FINISH ROLLING WORKPIECES OF SUBSTANTIALLY CIRCULAR CROSS-SECTION TO A SELECTED DIAMETER

Garrj Berstein, Erkelenz, and Hans J. Naumann, Wassenberg, both of Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt GmbH, Erkelenz, Fed. Rep. of Germany

Filed Jan. 13, 1978, Ser. No. 869,248
Claims priority, application Fed. Rep. of Germany, Jan. 15, 1977, 2701593
Int. Cl.[2] B21H *1/00*
U.S. Cl. 72—21 **10 Claims**



1. A method for finish rolling workpieces of substantially circular cross-section to a selected diameter comprising the steps of engaging circumferentially spaced portions of the workpiece by rolls rotatable about their axes; driving at least one of the rolls for rotation about its axis; moving at least one of said rolls towards the other with a speed not exceeding 0.1 mm per revolution of the workpiece until the portions of the rolls engaging the workpiece have reached a predetermined distance from each other in accordance with the selected diameter of the finished workpiece; and determining reaching of said predetermined distance by measuring the distance of the peripheral surfaces of the rolls at only two points in the working region of the rolls spaced from the portions of said rolls engaging the workpiece.

4,167,107

ROLLING MILL STAND

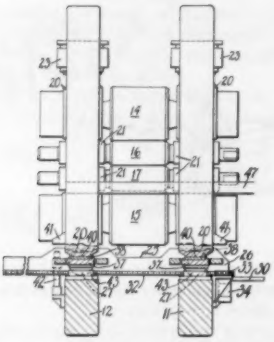
Edwin Simmonds, Ringwood, England, assignor to Loewy Robertson Engineering Company Limited, Dorset, England

Filed Oct. 31, 1977, Ser. No. 846,792

Claims priority, application United Kingdom, Nov. 2, 1976, 45514/76

Int. Cl.[2] B21B *31/08*

U.S. Cl. 72—239 **4 Claims**



1. In a rolling mill stand having

(a) first and second spaced housings each having therein a window;

(b) a plurality of rolls;

(c) bearing chocks for each said roll,

(d) the chocks of at least some of said rolls being slidingly received in said windows; and

(e) roll gap adjustment means carried by each said housing to act between the top of said housing and the uppermost of said rolls;

equipment for inserting and removing packers into and from said stand, said equipment comprising

(f) a carriage movable parallel to the axes of said rolls between an inoperative position outside said housings and an operative position at the bottom of each said window,

(g) said carriage being in said operative position during rolling;

(h) a pair of trays for carrying packers to be disposed operatively between the bottom of each said window and the lowermost of said rolls;

(i) upwardly acting resilient means on said carriage for supporting each said tray, which resilient means are located in each window when said carriage is in operative position and lift each said tray away from the bottom of the associated window unless each said tray is forced down by said rolls into contact with the bottom of the associated window; and

(j) means for lifting said rolls sufficiently to permit movement of said carriage between said operative and inoperative positions with said trays lifted by said resilient means.

4,167,108

ADJUSTABLE HOLE-ENGAGING HOOK DEVICE

Davis R. Jarman, 612 Ward Dr., and Virgil H. Hinson, 206 Fairway Oaks, both of Brunswick, Ga. 31520

Filed Sep. 28, 1977, Ser. No. 837,409

Int. Cl.[2] B21D *31/00*; A44G *13/00*

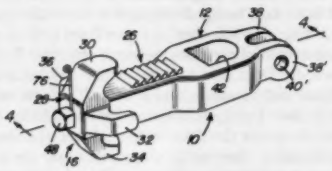
U.S. Cl. 72—477 **10 Claims**

1. An adjustable hole-engaging hook device, comprising, in combination:

(a) a body connectable to a pulling element;

(b) hook means mounted on the body and arrangeable in a hole provided in a vehicle frame member; and

(c) gripping means provided on the body for positively engaging the vehicle frame member provided with a hole in which the hook means is engageable as increasing force is applied to the body by a pulling element, the hook means including an adapter head rotatably mounted on the body and comprising a plurality of hooks of different sizes selected for engagement with holes of varying sizes provided on different vehicle frame members, the body including means for attachment to a pulling element, the



means for attachment being spaced from the hook means, and the gripping means including a wedge-shaped tooth angled away from the hook means and toward the means for attachment, the body being pulled toward the means for attachment so as to set the tooth into an associated frame member.

4,167,109

PROCESS FOR MEASURING TEMPERATURE WITH SOLID STATE TRACK RECORDERS

Raymond Gold, 1982 Greenbrook Blvd., Richland, Wash. 99352

Filed Jun. 22, 1978, Ser. No. 917,903

Int. Cl.[2] G01N *25/00*; G01T *5/00*

U.S. Cl. 73—15 R **5 Claims**

1. A process for determining thermal history of a solid state radiation track recorder comprising, in combination, the steps of:

selecting a group of solid state track recorders and dividing the total group into a sensor set and a control set;

pre-irradiating the total group of solid state track recorders so that each has substantially identical radiation impingement;

exposing the sensor set of solid state track recorders for a period of time at elevated temperatures, sufficient to cause physical change in the areas surrounding the sites of radiation impingement, in the environment under observation;

processing the total group of solid state track recorders under identical conditions to make radiation impingement on their surfaces observable;

measuring at least one physical characteristic of the radiation impingement sites of all solid state track recorders;

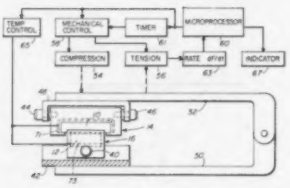
comparison of the measured physical characteristics of the radiation impingement sites of the sensor set of solid state track recorders to the same characteristics of the control set of solid state track recorders to determine the relationship and;

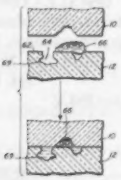
comparison of that relationship to a standard calibration scale to determine thermal history of members of the sensor set.

4,167,110
DEVICES AND PROCESSES FOR DETERMINING PROPERTIES OF VISCOUS FLUIDS

Louis Kopito, Brookline; Samuel R. Schuster, Wellesley, and Harold Kosasky, Brookline, all of Mass., assignors to Ovutime, Inc., Newton, Mass.

Filed Feb. 1, 1978, Ser. No. 874,215
Int. Cl.[2] G01N *33/16, 3/08*
U.S. Cl. 73—58 26 Claims





1. A device for testing the properties of a fluid, said device comprising:

(a) a pair of disposable test elements for presenting a pair of faces that are adapted for relative movement between remote locations at which said faces are apart and proximate locations at which said faces are in flush contact with each other;

(b) said faces having a pair of distributions of lands and cavities;

(c) said pair of distributions of lands of said faces being planar and being disposed geometrically in a pair of common planes;

(d) said pair of distributions of cavities of said faces being subordinate to said pair of common planes to form a pair of cavity networks;

(e) means for reciprocating said solid faces into and out of said flush contact with each other;

(f) portions of said pair of distributions of lands being in substantial contact with each other when said faces are in said flush contact with each other;

(g) said pair of cavity networks forming a composite network when said faces are in said flush contact with each other;

(h) whereby a small sample of said fluid between said faces is spread in said composite network during said movement into said proximate locations and the force associated with said movement into said remote locations is indicative of properties of said fluid.

4,167,111
BOREHOLE GEOLOGICAL ASSESSMENT

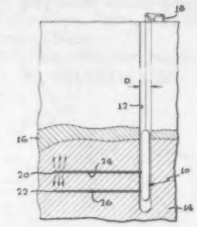
William H. Spuck, III, Arcadia, Calif., assignor to The United States of America is represented by the Administrator of the National Aeronautics & Space Administration, Washington, D.C.

Filed May 4, 1978, Ser. No. 903,019
Int. Cl.[2] E21B *47/10*
U.S. Cl. 73—155 9 Claims

8. A method for geologically assessing an underground formation located along a borehole, comprising:

boring a hole in a primarily horizontal direction from a location deep within said borehole into the wall of said borehole and into the surrounding strata, to a location which is spaced from said borehole by a distance of a plurality of diameters of said borehole;

placing a probe in said hole;



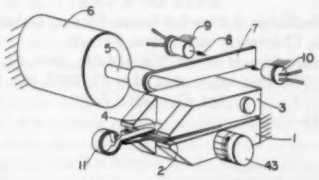
sealing at least a portion of said hole lying between the outer end portion of the probe and the hole; and

pumping fluid through the outer end portion of said probe.

4,167,112
MACHINE FOR TESTING ANEURYSM CLIPS

Erhard O. Ressler, New Braunfels, Tex., assignor to Kees Surgical Specialty Co., Wilder, Ky.

Filed Nov. 13, 1978, Ser. No. 960,235
Int. Cl.[2] G01L *1/04*
U.S. Cl. 73—161 5 Claims



1. A machine for testing the force of an aneurysm clip which comprises a pair of jaw support platforms for receiving jaws of the aneurysm clip on end portions thereof, means for mounting one of said jaw support platforms for movement crosswise of a selected position in which said end portions of the jaw support platforms are in adjacent spaced relation, motor means for advancing said one of the jaw support platforms to open the clip, means for supplying electric current to the motor means to drive the motor means, and means for measuring the current in the motor means to provide a measure of the force on the jaws of the clip.

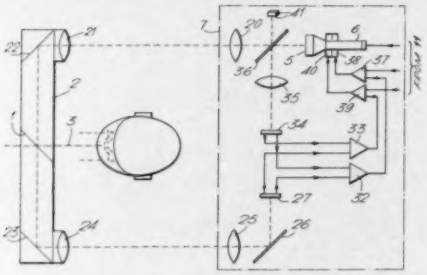
4,167,113
DISPLAY SYSTEMS

George Mann, Winchcombe, England, assignor to Smiths Industries Limited, London, England

Filed Nov. 25, 1977, Ser. No. 855,111
Claims priority, application United Kingdom, Dec. 3, 1976, 50540/76
Int. Cl.[2] G01C *21/00*
U.S. Cl. 73—178 R 13 Claims

13. A vehicle display system comprising a display unit for providing a display; means mounting said display unit on said vehicle; an optical element, said optical element including a partially-transparent reflector; means mounting said optical element on said vehicle independently of said display unit so as to reflect an image of said display; said display unit including a cathode-ray tube for providing said display, first sensor means, means for directing an image of said display onto said first sensor means via said optical element, said first sensor means providing an output in accordance with position of said image,

second sensor means, means for directing within said display unit, a second image of said display onto said second sensor means, said second sensor means providing an output in accordance with position of said second image; and modifying means, said modifying means modifying the position of the



display on said cathode-ray tube in accordance with the difference in outputs of said first and second sensor means caused by difference in position of the two images, such as to compensate for movement of said optical element relative to said display unit.

4,167,114

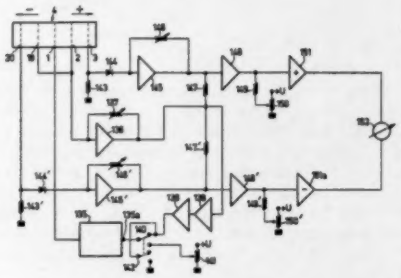
DEVICE FOR MEASURING THE MASS FLOW OR FLOW RATE OF A GAS

Jean-Louis Zizine, L'Hay-les-Roses, France, assignor to S.C.I. Le Brin, Champigny sur Marne, France

Continuation-in-part of Ser. No. 634,631, Nov. 24, 1975, Pat. No. 4,056,003. This application May 27, 1977, Ser. No. 801,423

Int. Cl.[2] G01F *1/56*

U.S. Cl. 73—194 F **21 Claims**



1. A bi-directional measuring device for measuring the mass flow of a gas, comprising:

first, second, third, fourth and fifth electrodes positioned in the path of said gas flow, said first, second, third, fourth and fifth electrodes being electrically isolated from each other, said second electrode being spaced from said first electrode in the flow direction, said third electrode being spaced from said second electrode in the flow direction, said fourth electrode being spaced from said first electrode in the counter-flow direction, said fifth electrode being spaced from said fourth electrode in the counter-flow direction, said second and fourth electrodes being arranged symmetrically with respect to said first electrode, said third and fifth electrodes being arranged symmetrically with respect to said first electrode, said second electrode being electrically connected to said fourth electrode;

a voltage source coupled between said first electrode and said second, third, fourth and fifth electrodes for producing a corona discharge localized about said first electrode and for creating an electric field such that the ions produced by said first electrode move toward said second electrode in the counter-flow direction;

a display device coupled between said third and fifth electrodes for displaying said gas mass flow; and

means coupled to said second, third, fourth and fifth electrodes and connected to a control input of said voltage source for stabilizing the current supplied to said first electrode.

4,167,115

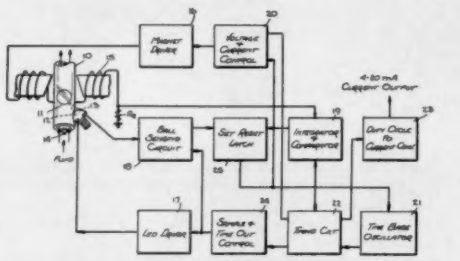
OSCILLATING-BALL FLOWMETER

Juergen Stoever, Warminster, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Jun. 29, 1978, Ser. No. 920,163

Int. Cl.[2] G01F *1/28*

U.S. Cl. 73—194 E **9 Claims**



1. An oscillating-ball flowmeter capable of accurately measuring extremely low flow rates, said flowmeter comprising:

A. a vertically-oriented flow tube through which the fluid to be metered flows in an upward direction;

B. a ferromagnetic ball disposed in said flow tube and movable therein, said ball being subjected to the downward force of gravity as well as the upward drag force imposed thereon by said fluid flow;

C. an electro-optical position detector projecting a beam of light which intercepts the ball at a detection position in said tube to produce a control signal;

D. an electromagnet to produce, when energized, a magnetic force in said tube seeking to raise the ball above the detection position;

E. a powered controller including a magnet driver for energizing the electromagnet, said controller being activated by the control signal to produce a magnet pulse energizing the electromagnet whereby said ball is lifted above said detection position away from said light beam and the electromagnet is thereafter de-energized, whereby the ball is caused to oscillate in the tube in an oscillation zone and the magnet current is pulsed at a corresponding frequency, an output signal being derived from said magnet pulses whose frequency varies as an inverse function of flow rate; and

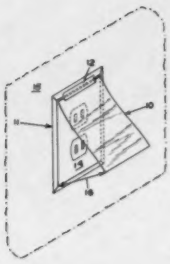
F. means to convert said output signal into an output current whose intensity is proportional to said flow rate, said converter means including means to subtract a value corresponding to said output signal and varying in accordance therewith from a constant value to produce an output value which is a direct function of flow rate.

4,167,116

METHOD OF DETERMINING HEAT LOSSES THROUGH ELECTRICAL OUTLETS

Nathaniel E. Hager, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Aug. 4, 1978, Ser. No. 930,880
Int. Cl.[2] G01F *1/28*
U.S. Cl. 73—228 4 Claims



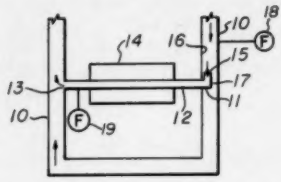
1. A method for determining the costs of heat energy losses by air infiltration through an electrical outlet, comprising the steps of:
(a) adhering the top of a sheet of metalized film to the top of the outlet,
(b) measuring the displacement of the bottom edge of the film from the faceplate of the outlet,
(c) correlating said displacement with an air-flow rate using a table,
(d) correlating the geographic location of the building in which the outlet is installed with a climatic position using a geographic chart, and
(e) cross indexing the air-flow rate with the climatic position on a table to arrive at an approximate estimated cost of energy losses through the outlet on an average basis.

4,167,117

APPARATUS AND METHOD FOR SAMPLING FLOWING FLUIDS AND SLURRIES

Charles O. Stokley; Thomas W. Muecke; Clay Gruesbeck, Jr., and William M. Salathiel, all of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jul. 10, 1978, Ser. No. 922,909
Int. Cl.[2] G01N *1/20*
U.S. Cl. 73—422 R 9 Claims



1. An apparatus for sampling the composition of fluid flowing through a fluid flow conduit comprising:
(a) a sampling conduit having an inlet disposed within said fluid flow conduit transverse to the axis of fluid flow in said fluid flow conduit and an outlet connected to said fluid flow conduit downstream of said inlet; and
(b) means for measuring the composition of fluid flowing through said sampling conduit, said fluid flow conduit having a length and diameter greater than the length and diameter of said sampling conduit to cause isokinetic withdrawal of fluid from said fluid flow conduit into said sampling conduit.

4,167,118

WHEEL FIXING DEVICE

Yukiyosi Hihara, Fujinomiya, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan

Filed May 10, 1978, Ser. No. 904,464
Int. Cl.[2] G01M *1/04*
U.S. Cl. 73—487 6 Claims

1. A wheel fixing device for a wheel balancer having an axle, comprising:
an adaptor comprising a shaft portion which is attached to the end surface of the axle and extends coaxially from the axle, and a flange portion which is adjacent to the end surface of the axle;
an adaptor mounting means for mounting coaxially the adaptor to the axle;
a push member which is slidably fitted on the shaft portion of the adaptor, which has an annular groove facing the flange portion in its outside portion, and which includes a plurality of mounting holes arranged inside of the annular groove at the same distance from the axis of the adaptor;
a coupling ring which is fitted into the annular groove of the push member and includes a plurality of slots arranged radially corresponding to the mounting holes in number and position;
a plurality of links, each being provided with a first pin which is attached to one corner of the link and is fitted into the mounting hole, and a second pin which is fitted into the slot of the coupling ring, which are pivoted around the first pin by rotating the coupling ring;
a plurality of third pins for holding a vehicle wheel attached to the other corner of the link and facing the flange portion; and
a closing handle which is screwed on the shaft portion of the adaptor and closes the adaptor to the flange portion thereof so that the wheel may be secured between the push member and the flange portion of the adaptor.

4,167,119

APPARATUS FOR MEASURING FREQUENCY OF ROTATION OF A SHAFT

Boris F. Brjukhov, Chelyabinskaya oblast; Nikolai B. Buchin, and Vasily P. Shilov, both of Chelyabinsk, all of U.S.S.R., assignors to Nauchno-Issledovatelsky I Proektno-Konstruktorsky Institut Po Dobyche, Chelyabinsk, U.S.S.R.

Filed Mar. 27, 1978, Ser. No. 890,695
Int. Cl.[2] G01P *1/04, 3/48*
U.S. Cl. 73—488 1 Claim

1. An apparatus for measuring the frequency of rotation of a shaft, comprising:
reducing gear connected to said shaft of which the frequency of rotation is to be measured;
a solenoid-operated clutch having an input shaft and an output shaft, said input shaft being connected with said reducing gear;

a return spring mounted on said output shaft of said solenoid-operated clutch;

a driver fast with the end of said output shaft of said solenoid-operated clutch;

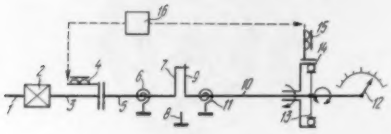
a memory mechanism including:

an overrunning clutch having an input shaft and an output shaft;

an actuator coupled in driven relationship with said driver, said actuator being fast with the end of the input shaft of said overrunning clutch;

a return spring mounted on said input shaft of said overrunning clutch;

an internal cage of said overrunning clutch mounted on either one of said shafts thereof;



an external cage of said overrunning clutch mounted on the other one of said shafts thereof for rotation relative to said internal cage;

a solenoid-operated brake having an electric input and a mechanical output operatively connected with said external cage of said overrunning clutch;

a pulse generator having two outputs of which one is connected to said solenoid-operated clutch and the other one is connected to said electric input of said solenoid-operated brake; and

an indicator of the frequency of the rotation of said first-mentioned shaft, having the indicating member thereof fast with said input shaft of said overrunning clutch.

4,167,120

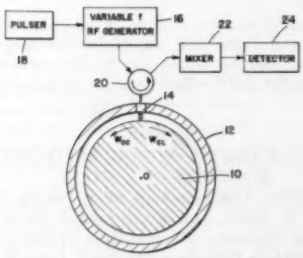
SURFACE ACOUSTIC WAVE BRIDGE FOR ROTATION MEASUREMENT

Herbert J. Shaw, Stanford, Calif.; Jacques Souquet, Cagnes-sur-Mer, France, and Christopher M. Fortunko, Thousand Oaks, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 18, 1978, Ser. No. 906,909

Int. Cl.[2] G01P *3/44*

U.S. Cl. 73—505 **10 Claims**



1. An apparatus for measuring the rotation rate of a rotor comprising:

(a) means fixed adjacent to said rotor for generating counter-rotating surface acoustic waves on said rotor;

(b) means for detecting the phase difference between said counterrotating surface acoustic waves resulting from the rotation rate of said rotor relative to said generating means; and

(c) means for varying said phase difference.

4,167,121

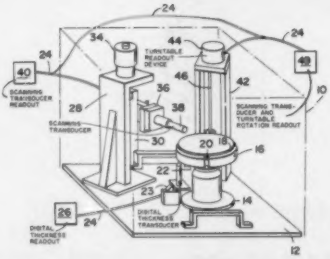
PRECISION ULTRASONIC EVALUATION AND RECORDING SYSTEM

John W. Mauch, Danville, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 8, 1978, Ser. No. 903,431

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—640 **8 Claims**



1. A precision ultrasonic evaluation and recording system comprising:

(a) means for rotatably retaining general metal cylinders, said cylinders to be ultrasonically inspected for structural integrity flaws;

(b) means for vertically locating circular sections in said general metal cylinders by beaming ultrasonic energy perpendicularly into said general metal cylinder along its longitudinal axis, said locating means positioned below said retaining means and said metal cylinder;

(c) first means connected to said locating means for digitally displaying said vertical location of said circular section within said general metal cylinder;

(d) means for scanning said circular section for structural flaws, said scanning means intermittently emitting a beam of ultrasonic energy normal to the surface of said general metal cylinder and receiving ultrasonic flow detection information as said general metal cylinder is rotated by said rotatable retaining means;

(e) means for vertically positioning said scanning means;

(f) second means connected to said scanning means for displaying said flaw detection information;

(g) means connected to said retaining means for generating an electrical signal proportional to degree of rotation of said retaining means;

(h) third means connected to the output of said scanning means and said generating means for recording permanent inspection test results; and

(i) a tank for enclosing said retaining means, said locating means, said scanning means and said generating means for immersion in a liquid medium.

4,167,122

PRESSURE SENSING CELL FOR FORCE-BALANCE TRANSMITTER

William A. Siegel, Norristown, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Oct. 16, 1978, Ser. No. 951,482

Int. Cl.[2] G01L *7/08*

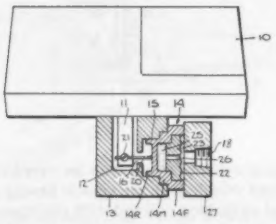
U.S. Cl. 73—706 **7 Claims**

1. A pressure-sensing cell responsive to an applied input pressure to produce a force for deflecting the pivoted force beam in the transducer section of a transmitter adapted to convert the pressure into an output signal, the transmitter having a meter body provided with a chamber into which the low end of the beam extends and a side socket communicating with the beam chamber, said cell comprising:

A. a housing seatable in said socket and divided into a rear section, a mid section and a front section;

B. a wafer disposed within said rear section and integral with the wall thereof at its junction with the mid section, said wafer functioning as a sensing diaphragm and having a connector pin that projects into the body chamber and is joinable to the beam whereby deflection of the sensing diaphragm results in a corresponding beam deflection;

C. a barrier diaphragm supported within the front section adjacent the mouth thereof; and



D. a back-up nest seated within the front section, the face of the nest being spaced from the barrier diaphragm to form a free space which communicates through a tube in the nest with a fill chamber defined by the space between the back of the nest and the wafer, the intercommunicating spaces being filled with hydraulic fluid whereby movement of the barrier diaphragm in response to an applied pressure is hydraulically transmitted to the sensing diaphragm to produce a force which deflects the beam.

4,167,123

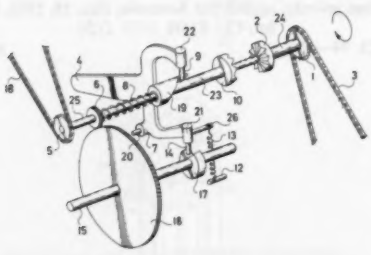
PROGRAM UNIT FOR ACCURATE ACTUATION AND CONTROL OF INDIVIDUAL OPERATIONS

Vladimir Jakl; Josef Cink, and Filip Bacovsky, all of Sumperk, Czechoslovakia, assignors to Vyzkumny ustav lykovych vlaken Sumperk and Strojni a traktorova stanice v Zatci, narodni podnik Zatec Corporation, Czechoslovakia

Continuation-in-part of Ser. No. 775,846, Mar. 9, 1977, abandoned. This application May 11, 1977, Ser. No. 795,863

Int. Cl.[2] F16D *27/10*

U.S. Cl. 74—125.5 **1 Claim**



1. A program unit for accurate actuation and control of individual operations comprising in combination:

a rotatable through shaft,

a first sleeve rotatably mounted on one end of said through shaft,

a claw clutch having a stable part fixed on one end of said sleeve and a slidable part selectively engageable with said stable part,

means for coupling said through shaft to a working unit for rotation therewith,

a back-shaft parallel to said through-shaft,

a first toothed wheel mounted on said through-shaft adjacent the other end thereof,

a second toothed wheel and a copying disk provided with a recess on its circumference fixed on said back-shaft for rotation therewith, the second toothed wheel meshing with the first toothed wheel,

a disconnecting disk having a helical or spiral cam configuration,

a second sleeve slidably supported on the through shaft and mounted for rotation therewith, the slidable part of said claw clutch and said disconnecting disk being fixed on said second sleeve for rotation therewith,

a fixed bolt,

a forked lever pivotably supported on said fixed bolt, said lever having two arms,

said means for coupling said shaft to a working unit being selectively activated by a mechanical impulse on said forked lever,

a copying pin secured to one arm of said forked lever, the other arm of said lever having an adjustable stop pin adapted for selective engagement with said disconnecting disk,

a first spring for urging said copying pin against said copying disk, and

a second spring for urging said slidable claw clutch part toward said stable claw clutch part to engage said clutch,

said stop pin engaging said disconnecting disk cam configuration and said copying pin engaging said copying disk recess in an uncoupled mode of said unit, said lever being rotatable by said mechanical impulse to move said pins away from said disks and recess to allow said second spring to engage said clutch parts for a single revolution of said copying disk, said copying pin thereafter being urged into said recess by said first spring and causing said stop pin to engage said helical or spiral configuration of said disconnecting disk to move said slidable clutch part away from said stable clutch part on roatation of said disconnecting disc.

4,167,124

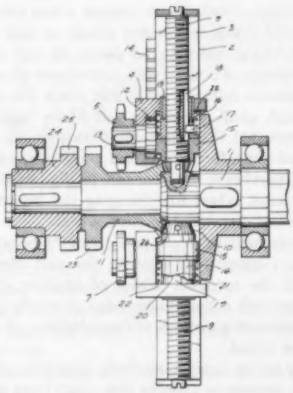
VARIABLE-SPEED CHAIN DRIVE UNIT

Atanas Z. Zvetkov, and Stanislav Z. Zvetkov, both of Sofia, Bulgaria, assignors to DSO "RODOPA", Sofia, Bulgaria

Filed Apr. 1, 1977, Ser. No. 783,825

Int. Cl.[2] F16H *55/30, 55/54*

U.S. Cl. 74—230.19 **6 Claims**



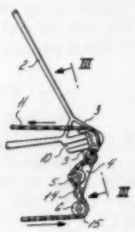
1. A drive unit for varying the transmission ratio between two rotatable parallel shafts, comprising:

a respective disk fixedly mounted on each of said shafts for rotation therewith;

a plurality of radial grooves formed in each of said disks;

a respective bearing provided in each of said grooves;
a wheel journaled in each of said bearings;
an endless chain engaging at least one of said wheels on each of said disks;
a respective nut provided in each of said bearings and limitedly radially displaceable relative thereto;
a respective radial screw provided in each of said grooves and engaging said nut in said bearing in said respective groove;
means on said drive unit for rotating said screws in opposite directions on said respective disks;
a respective compression spring between each of said nuts and said bearings;
respective cam means between each of said nuts and said bearings enabling said nuts to be displaced by said screws during engagement of the respective wheel of said bearing by said chain, whereby said bearing is displaced outwardly by said spring relative to said nut upon release of said respective wheel by said chain; and
respective means engageable by said nuts on each of said bearings for the inward displacement of said bearings.

4,167,125
REAR-WHEEL MOUNTING FOR BICYCLE
Eberhard Hedrich, Osdorfer Landstr. 161, Hamburg, Fed. Rep. of Germany (D-2000)
Filed Apr. 20, 1977, Ser. No. 789,227
Int. Cl.[2] F16H *7/18*
U.S. Cl. 74—242.5 **6 Claims**

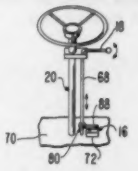


1. In a bicycle provided with a frame, a rear axle detachably secured to said frame, a traction wheel on said rear axle, a pedal-driven chain, transmission means on said rear axle including a plurality of coaxial sprocket wheels of progressively smaller diameters coacting with said chain for rotating said traction wheel, guide means on said frame engaged by said chain and provided with chain-tensioning means, and control means on said frame for shifting said guide means in a direction substantially parallel to said rear axle to align said chain with a selected sprocket wheel for changing the transmission ratio between the pedal and said traction wheel.

the improvement wherein said frame is provided with a stationary supporting element for said chain disposed adjacent the sprocket wheel of smallest diameter and provided with a curvilinear edge generally paralleling a chain-contacting portion of the periphery of the adjacent sprocket wheel,

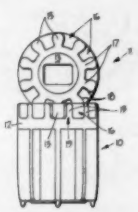
said guide means being selectively alignable with said supporting element to transfer said chain from said adjacent sprocket wheel to said supporting element preparatorily to a detachment of said rear axle from said frame, said control means including a manually displaceable lever provided with releasable stop means for normally preventing the alignment of said guide means with said supporting element.

4,167,126
CONTROL SYSTEM FOR VEHICLE OVERDRIVE TRANSMISSION
William K. Hixon, One Scott Ct., Scotts Valley, Calif. 95066
Filed Aug. 15, 1977, Ser. No. 824,477
Int. Cl.[2] F16H *5/42, 5/46*
U.S. Cl. 74—336 R **6 Claims**



1. A control system for use with an overdrive transmission of a motorized vehicle with the vehicle having a movable gear shift rod and an ignition coil and with said transmission having a governor switch and an actuating solenoid comprising: an electrical circuit part including a relay coil and a limit switch, said limit switch having an actuating arm, said circuit part adapted to be coupled to said governor switch and to a voltage source in series relationship therewith to form a circuit, said relay having first and second sets of electrical contacts, the first set of contacts being operable to couple the coil of the solenoid to a source of electrical current when said relay is energized, the second set of contacts being operable to couple the distributor side of the ignition coil to ground when the relay is deenergized, a bracket adapted to be mounted on the gear shift rod, said limit switch having means thereon for mounting the same adjacent to said gear shift rod at a location with the actuating arm of the limit switch normally engaging the bracket when the bracket is on the rod and when the switch is mounted adjacent to said gear shift rod to cause actuation of the limit switch in response to the movement of the gear shift rod relative to the limit switch.

4,167,127
ANGLE MESHING GEAR
Ronald J. Calvert, Edwardstown, Australia, assignor to Hills Industries Limited, Edwardstown, Australia
Filed Dec. 12, 1977, Ser. No. 859,587
Claims priority, application Australia, Dec. 15, 1976, 8496/76
Int. Cl.[2] F16H *1/12, 1/20*
U.S. Cl. 74—416 **4 Claims**



1. An angle meshing gear which is co-operable with a similar angle meshing gear when the gear axes of rotation are inclined to one another, comprising:

a cylindrical base,

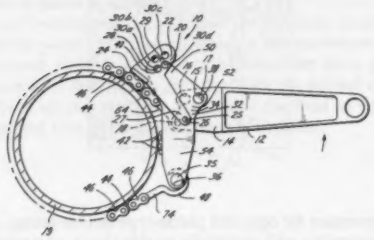
a boss of smaller diameter than the base, coaxial with the base, and projecting from the base, and

a plurality of teeth extending radially from the boss, each tooth having its root integral with the boss and one end integral with the cylindrical base, adjacent walls of adjacent teeth being substantially parallel for portions of their lengths, the tooth forms being bulbous.

4,167,128
APPARATUS FOR IMPARTING TORSION TO A TUBULAR MEMBER

Arthur R. Chandler, and Victor Moody, both of Suffolk, England, assignors to Weatherford/Lamb, Inc., Houston, Tex.

Filed Apr. 14, 1978, Ser. No. 896,278
Int. Cl.[2] B25B *13/52*
U.S. Cl. 81—66 R 5 Claims

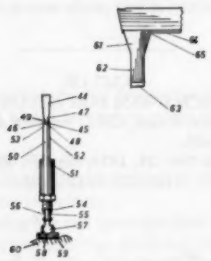


1. An apparatus for imparting torsion to a tubular member, comprising,
(a) a body member, having a first end, a second end, and a midsection,
(b) an arm member, having a pivot block at one end thereof pivotally connected to the midsection of the body member,
(c) a saddle member, having a pivot end and a pinion end, the pivot end of said saddle member pivotally connected to the midsection of the body member, the pinion end pinioned to the first end of the body so that upon actuation of the arm member the pinion end of the saddle member contacts the outside of the chain for holding the chain against the tubular member thereby preventing the slippage of the chain.

4,167,129
CUT-OFF TOOL AND SUPPORT THEREFOR

Henry Leunissen, 1811 Woodland Ave., Palo Alto, Calif. 94303

Filed Jan. 16, 1978, Ser. No. 869,511
Int. Cl.[2] B23B *29/12*
U.S. Cl. 82—36 R 8 Claims

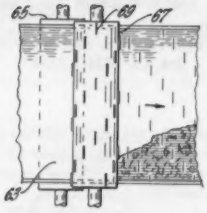


1. A cut-off tool and support therefor comprising:
an elongated cut-off tool means having a first end, a second end, an upper edge, a lower edge and a maximum width, where said upper edge includes a cutting portion proximate said first end and said lower edge is provided with a centering means extending at least partially from said first end to said second end; and
support means including
an elongated body section having a first end with an elongated surface profile that is slidingly matable with said centering means and having a spade portion extending from said first end at least partially to a second end thereof having a dimension taken perpendicularly to said elongate surface profile that is less than said maximum width, and
swivel base means coupled to said second end of said body section having a planar contact surface that is always in substantially flat contact with a support surface.

4,167,130
METHOD FOR CUTTING SHEET MOULDING COMPOUND REINFORCING STRANDS

Everett R. Miller, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 22, 1977, Ser. No. 863,298
Int. Cl.[2] B26F *1/20*
U.S. Cl. 83—866 6 Claims

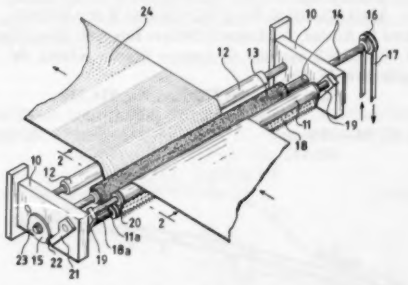


1. A method of cutting continuous reinforcing strands positioned in a sheet of sheet molding compound comprising:
(a) contacting said sheet with cutting edges;
(b) piercing said sheet with said cutting edges to form a plurality of discontinuous cuts extending along the width of said sheet and to cut said reinforcing material contained in said sheet.

4,167,131
SKIP PERFORATOR

Walter F. Habas, and Laurence E. Elliott, both of Savannah, Ga., assignors to Union Camp Corporation, Wayne, N.J.

Filed May 18, 1978, Ser. No. 906,953
Int. Cl.[2] B23D *25/12*
U.S. Cl. 83—304 4 Claims



1. Apparatus for all-over and skip perforation of a ply for a multiwall bag moving between the ply unwind stand and the multiwall tuber comprising:
an idler roll and a back-up roll spaced from each other to permit the moving ply to pass from the idler roll to the back-up roll;
the idler and back-up rolls being driven by friction from the moving ply;
a perforator pin roll positioned parallel to the idler and back-up rolls and adjacent to the back-up roll, the ends of the perforator pin roll being connected to the ends of the idler roll to permit the perforator pin roll to pivot about the idler roll;

the perforator pin roll being driven from the idler roll at the speed of the idler roll; and

means to move the perforator pin roll into and out of contact with the moving ply against the back-up roll;

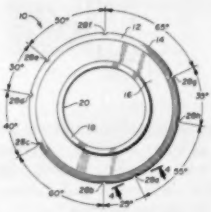
whereby the all-over perforation of the ply can be interrupted for predetermined periods to provide no perforation in areas of the ply where interply pasting will occur.

4,167,132

CUTTER RING FOR TRIMMING PRINTED CIRCUIT BOARDS

Gary R. Zontelli, 14617 Woodhill Ter., Minnetonka, Minn. 55343

Filed Feb. 13, 1978, Ser. No. 877,258
Int. Cl.[2] B26D *1/14*
U.S. Cl. 83—676 **8 Claims**



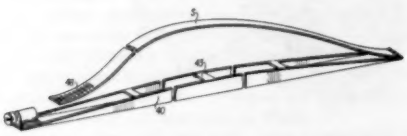
1. A cutter ring provided with a peripheral beveled knife edge formed with a number of irregularly spaced notches, said notches curving inwardly from said peripheral knife edge and said notches having unequal angles therebetween.

4,167,133

STRINGED MUSICAL INSTRUMENT NECK ADJUSTABLE TO COUNTERACT WARPING

Andrew B. Adams, Jr., General Deliver Box 844, Shepardstown, W. Va. 25443, assignor to Andrew Borden Adams, Jr., Shepardstown, W. Va.

Filed Jun. 16, 1978, Ser. No. 916,250
Int. Cl.[2] B10D *3/06*
U.S. Cl. 84—293 **13 Claims**



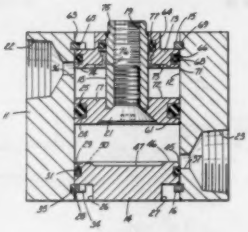
1. A stringed musical instrument comprising: a neck; neck straightening means within said neck for countering warping of it due to the tension forces of said strings, said neck straightening means comprising (a) a strap whose major transverse cross-sectional dimension is substantially parallel to the plane of the strings, one end of said strap being secured adjacent one end of said neck and the other end of said strap being secured adjacent the other end of said neck, (b) means constraining said strap to a bowed configuration along its length, and (c) means for tensioning the strap along its length whereby upon tensioning, said strap coacts with said constraining means to produce forces upon said neck counter to said string tension forces.

4,167,134

COMPACT FLUID ACTUATOR

Lawrence F. Yuda, 3030 Jeanne Dr., Parma, Ohio 44134

Filed Feb. 28, 1977, Ser. No. 772,989
Int. Cl.[2] F01B *11/02*; F15B *15/22*
U.S. Cl. 91—405 **4 Claims**



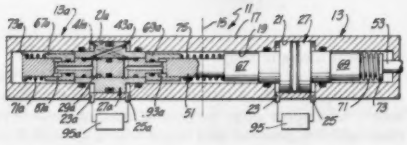
1. A compact air operated piston-type double-acting actuator, for operation with essentially no side thrust, comprising an operating cylinder having a longitudinal cylindrical bore and inlet-exhaust ports; end walls removably secured within said cylindrical bore, near each end thereof, and in fluid-tight engagement therewith, each of said end walls being devoid of air port means for placing said bore in fluid communication with a reservoir of air outside said cylinder, and each end wall having a counterbored central recess in its inner face to provide an annular boss having a circumferential bevel on the outside surface of said boss, said central recess having an area in the range from about 60 percent to about 85 percent of the cross-sectional area of said cylindrical bore; a reciprocable piston disposed in said cylindrical bore, said piston being movable in response to air pressure acting thereon, compressible sealing means disposed between said piston and said cylinder, an operating shaft extending outwardly through one of said end walls; and air cushioning means for decelerating said piston as it approaches the limit at each end of its travel within said cylindrical bore, including a cushion chamber defined by a transverse planar surface of said piston in abutment against said annular boss of each end wall, and a vent passage in said annular boss, said vent passage placing said cushion chamber in directly linear preselectedly restricted fluid communication with an inlet-exhaust port in said operating cylinder, wherein said inlet-exhaust port is disposed adjacent an end wall and is at least partially blocked as said piston moves towards said annular boss.

4,167,135

ANTI-JAM MECHANISM FOR ACTUATION PISTONS

Charles T. Lindsey, Irvine, Calif., assignor to Bertea Corporation, Irvine, Calif.

Filed Nov. 18, 1977, Ser. No. 852,723
Int. Cl.[2] F01B *1/02*
U.S. Cl. 92—61 **16 Claims**



1. A fluid control device comprising:

a drive piston having first and second faces;

drive means;

means for mounting said drive piston and said drive means for movement;

said drive piston having first and second fluid responsive faces exposable to fluid under pressure with the fluid

pressure acting on said first face urging said drive piston in a first direction and the fluid pressure acting on said second face urging the drive piston in a second direction;

first overridable detent means for drivingly coupling the drive piston and the drive means for movement with a first variable coupling force when the drive piston is moved in said first direction with the first coupling force varying with the pressure of the fluid to which the first face of the drive piston is exposed; and

second overridable detent means for drivingly coupling the drive piston and the drive means for movement with a second variable coupling force when the drive piston is moved in said second direction with the second coupling force varying with the pressure of the fluid to which the second face of the drive piston is exposed.

4,167,136

BEVERAGE BREWER

Garry C. Chupurdy, 2494 23rd St., Wyandotte, Mich. 48192

Filed Jul. 25, 1977, Ser. No. 818,542

Int. Cl.[2] A47J *31/10*

U.S. Cl. 99—306 **14 Claims**

1. A beverage brewer, having first and second members for use in conjunction with a brewed beverage receiving receptacle, comprising:

(1) a first member comprising:

means for seating said first member on the brewed beverage receiving receptacle,

means for issuing brewed beverage from the first member into the brewed beverage receiving receptacle,

said first member having a chamber for receiving a ground foodstuff,

(2) a second member interconnectable with the first member, the second member having at least one aperture formed therein for passing a brewing fluid from the second member to said chamber, and

gasket means defining an atmospheric seal upon interconnection between the first and second members, said atmospheric seal resulting in an air pressure differential between the atmosphere and said chamber, on introduction of the brewing fluid, which draws the brewing fluid through the brewer, limiting the holding time of the brewing fluid in the chamber and preventing the accumulation of fluid in the chamber and the floating or soaking of the ground foodstuff therein.

4,167,137

METHOD AND APPARATUS FOR FRYING THIN POTATO SLICES TO CHIPS

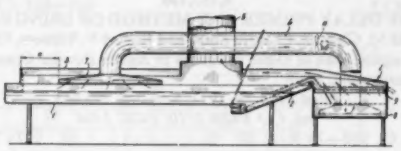
Hendrikus H. J. van Remmen, Zetten, Netherlands, assignor to Instituut Voor Bewaring en Verwerking Van Landouwprodukten, Wageningen, Netherlands

Filed Feb. 22, 1977, Ser. No. 770,775

Claims priority, application Netherlands, Feb. 24, 1976, 7601876

Int. Cl.[2] A47J *37/12*

U.S. Cl. 99—352 **3 Claims**



1. An apparatus suitable for frying a product comprising thin potato slices and forming chips thereof which comprises,

a first frying means including an oil vessel for at least partially frying and displacing said product from one end of the vessel to its opposite end,

a hood extending over the oil vessel including a first exhaust and conduit means for collecting heated frying vapors from said oil vessel,

a second frying means comprising a drying chamber cooperatively associated with the opposite end of said first frying means by means of a conveyor for transporting said product from said oil vessel to said drying chamber for removing moisture therefrom,

perforated conveyor means within said drying chamber for receiving and supporting said product for the drying thereof,

said conveyor means dividing said drying chamber into an upper space and a lower space, and

a second exhaust and conduit means associated with said oil vessel and said drying chamber for bypassing at least a portion of said heated frying vapors from said oil vessel into a space on one side of said perforated conveyor means to cause said heated frying vapors to flow through the product-laden perforated conveyor to the other space of said drying chamber and out and thereby reduce moisture in said product.

4,167,138

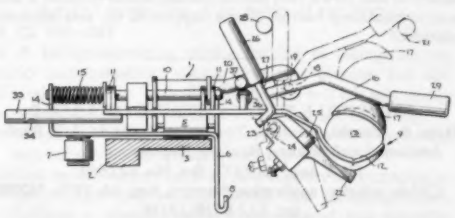
CRACKING HEAD FOR AN EGG BREAKING MACHINE

William H. Warren, 649 Palm Cir. E., Naples, Fla. 33940

Filed Nov. 7, 1977, Ser. No. 849,040

Int. Cl.[2] A23B *4/04*

U.S. Cl. 99—498 **2 Claims**



1. In an egg cracking head for an egg breaking machine having a pair of egg supports including outer egg holding end portions and means for pivotally attaching said supports for hinged movement and with an egg cracking knife pivotally attached to each support at facing edges thereof and having a generally straight cracking edge the improvement comprising

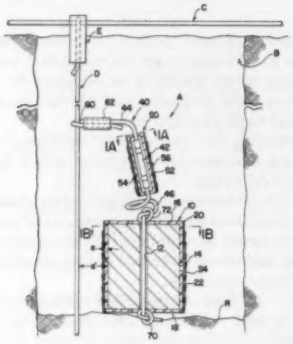
means for positioning said knives for movement between a first cocking position spaced from an egg held in said end portions and a second egg cracking position with the said cracking edges of the knives penetrating the egg and extending inwardly and upwardly from a point adjacent to where a vertical center line crosses the bottom of the egg shell and with said cracking edges being positioned at an acute angle to the said center line whereby a lowermost portion of the cracked egg shell is exposed for drainage.

4,167,139

TIME DELAY PRIMER AND METHOD OF USING SAME

David M. Gleason, Chagrin Falls, and Robert V. Vickers, Shaker Heights, both of Ohio, assignors to Austin Powder Company, Beachwood, Ohio

Filed May 23, 1977, Ser. No. 799,463
Int. Cl.[2] F42B *3/10*; F42C *1/04*
U.S. Cl. 102—24 R **7 Claims**



1. A delay primer unit for detonating an explosive material in a borehole with a detonating cord down line extending into said borehole, said primer unit comprising: an explosive element capable of detonating said explosive material upon being detonated; an elongated, generally flexible time delay detonating means for connecting said explosive element and said down line, said detonating means forming the only connection between said explosive element and said down line and including first and second mutually movable ends at least one of which is formed from a length of detonating cord and a detonation time delaying element between said mutually movable ends; first coupling means for slidably securing said first end in detonation transfer relationship with said down line whereby said first end can slide along said down line; second coupling means for securing said second end in detonation relationship with said explosive element; and, detonation insulating means for preventing detonation of said explosive element directly by detonation of said down line, said insulating means includes a detonation insulating barrier means supported on said explosive element.

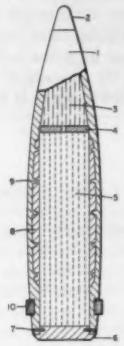
4,167,140

PROJECTILE FOR SCATTERING OF A LOAD

Hans B. Biseröd, Raufoss, Norway, assignor to A/S Raufoss Ammunisjonsfabrikker, Raufoss, Norway

Filed Aug. 23, 1977, Ser. No. 827,067
Claims priority, application Norway, Aug. 24, 1976, 762908
Int. Cl.[2] F42B *13/14*
U.S. Cl. 102—66 **4 Claims**

1. A projectile containing a load to be ejected therefrom during flight, comprising, a one-piece elongated casing having a streamlined outer surface and having a portion defining a space containing the load, a removable base enclosing the space and being adapted for removal or break up during ejection of the load, such ejection capable of being effected by an ejector charge or a mechanical device with a delay relative to the moment of firing the projectile, said casing being of steel material and having a first wall thickness along a section of said portion which is less than the wall thickness at the remainder of said portion, a metallic cylindrical liner at said section in engagement with an inner wall of said casing, said liner being of a material of less weight relative to said steel material, said liner having an inner diameter substantially equal to an inner diameter of said remainder of said casing portion containing the load, an external guide ring on said casing at a location of



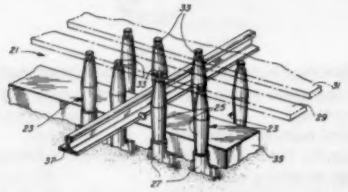
greater wall thickness relative to said first wall thickness, and an outer surface of said liner and said inner wall of said casing having interengaging projections and grooves disposed transversely of said casing, whereby any weakened areas caused by an interconnection between two parts of said casing are avoided by said one-piece casing thereby assuring ejection of the load through said removable base, and whereby said interengaging projections and grooves prevent said liner from moving longitudinally relative to said casing to thereby avoid any fractures in said liner caused by inertia forces during firing.

4,167,141

PERCUSSIVE TOOL WITH REPLACEABLE WORK BIT

Glen H. Haywood, 4207 Cedarwood, Matteson, Ill. 60443

Filed May 11, 1977, Ser. No. 795,718
Int. Cl.[2] E01B *27/00*
U.S. Cl. 104—10 **11 Claims**



1. A tamping tool for use with railroad bed tamping apparatus comprising:

a shank, the upper end of said shank being attachable to the tamping apparatus;

a removable tamping foot to be affixed to said shank;

a socket formed in said tamping foot;

a socket engaging portion formed at the lower end of said shank, forcible insertion of said socket engaging portion into said socket producing a force fit to secure said tamping foot to said shank with a fluid-tight joint;

an expandable chamber formed between the lower end of said shank and the bottom of said socket;

a passageway extending from said expandable chamber through said shank;

a fitting located on the tamping tool above said expandable chamber and connecting with said passageway, said fitting

being selectively attached to pumping means to drive a fluid through said passageway to said expandable chamber to generate a pressure sufficiently great to break said fluid-tight joint between said shank and said tamping foot and permit removal of said tamping foot by hand; and

locking means replacing said fitting to further secure said tamping foot to said shank during tamping action, said fitting being substituted for said locking means when it is desired to remove said tamping foot.

4,167,142

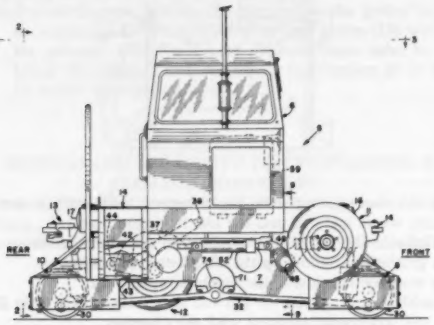
CONVERTIBLE RAILWAY CAR SHIFTING LOCOMOTIVE

Victor H. Ames, Midlothian, Ill., assignor to Whiting Corporation, Harvey, Ill.

Filed Oct. 21, 1977, Ser. No. 844,309

Int. Cl.[2] B61C *9/08, 11/00, 13/00, 15/00*

U.S. Cl. 105—26 R **15 Claims**



1. In a rail car moving vehicle adapted for travel in a first mode on a railway track on flanged rail wheels and in a second off-track mode on ground wheels, said vehicle having a front end and a rear end and including, frame means, a prime mover mounted on said frame means, a front rail wheel set mounted on said frame means, a rear rail wheel set mounted on said frame means, a front pair of steerable ground wheels, a rear pair of juxtaposed ground wheels fixed in a fore and aft direction, said ground wheels being aligned in the same direction as said rail wheels, means for raising and lowering said ground wheels with respect to said frame means so as to interchangeably convert said vehicle from one of said travel modes to the other, a rear coupler, means adjustably supporting said rear coupler on said frame means at different elevations with respect thereto for transferring weight from a rail car coupled thereto to said vehicle for increasing the traction between said rear rail wheel set and the railway track, and, power transmitting means drivably inter-connecting at least one of said rail wheel sets with said prime mover, the improvement comprising:

disposing said rear pair of ground wheels (1) forward of said rear rail wheel set and of the head of said rear coupler, (2) sufficiently close together to fit between and accommodate the gauge of the rear rail wheel set mounted on said frame means, and (3) so that when lowered for said off-track travel mode the treads thereof have frictional driving engagement with the mid-portion of the axle of said rear rail wheel set;

having said rear pair of ground wheels raisable toward the front end of said vehicle;

disposing said front pair of steerable ground wheels outboard of said frame and of the gauge of the front rail wheel set mounted on said frame means; and,

said disposition of said ground wheels providing a generally triangular configuration with said rear pair of ground wheels located at the rear point of the triangle and each of said front steerable ground wheels located at one of the two front points of the triangle.

4,167,143

PNEUMATIC BOGIE PITCH STABILIZER

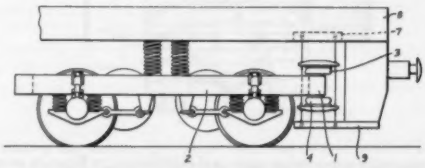
Friedhelm Bitterberg, Fuldatal, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Oct. 25, 1977, Ser. No. 845,408

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1976, 2648113

Int. Cl.[2] B61F *1/10, 3/04, 5/24, 5/52*

U.S. Cl. 105—164 **3 Claims**



1. In an apparatus for preventing pitching of a driving bogie with a frame and a vehicle body frame under pulling force effectiveness and for damping vertical movements of a rail vehicle with supporting springs interconnecting the bogie frame and the vehicle body frame, such apparatus being arranged at least at one interface of the bogie frame and supported respectively at least at one of the locations including an upper and also an underside of the bogie frame on one hand and the vehicle frame on the other hand while providing air springs located one above another and pressure controlled by a conduit system connected to a source of compressed air and alternately operable valve means provided for adjustment of pressure force, the improvement in combination therewith comprising: supports on the bogie frame for the air springs located one above the other, each of the supports including beam means connected to the air springs, the air springs being arranged in pairs with one air spring of each pair being connected to the top side of the bogie frame and the other air spring of the same pair being connected to the bottom side of said bogie frame, and steel cables fastened to the respective airspring and to said vehicle frame, said beam means of both air springs being angularly offset relative to each other by substantially a right angle.

4,167,144

BUCKLE SUPPORTING AND ANTI-PILFERING ASSEMBLY

Leslie W. Martin, Lansing, and Richard A. LeBeau, Palos Heights, both of Ill., assignors to Unarco Industries, Inc., Chicago, Ill.

Filed Sep. 19, 1977, Ser. No. 834,417

Int. Cl.[2] B60P *7/08, 7/14;* **B61D** *45/00, 49/00*

U.S. Cl. 105—467 **6 Claims**

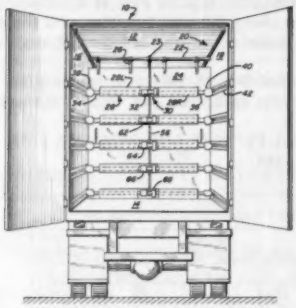
1. A lading-restraining device for use in lading-carrying vehicles and containers which have top, bottom, and side walls, said side walls including at least one belt rail said device adapted to restrain the movement of lading and including:

a laterally-extending and longitudinally-movable overhead support positioned adjacent said top wall;

curtain means suspended from said support for engaging an unrestrained face of said lading, and including means defining a plurality of vertically-spaced and laterally-extending belt-receiving pockets on one side thereof,

a plurality of vertically-spaced and laterally-extending restraining belt means, each positioned within a pocket, said belt means having sidewall-engaging means at each end for engaging a belt rail, and buckle means positioned therebetween for tightening said belt means,

wherein the improvement comprises therebeing further provided buckle-support and pilferage-resistant means cooperatively associated with each buckle means for



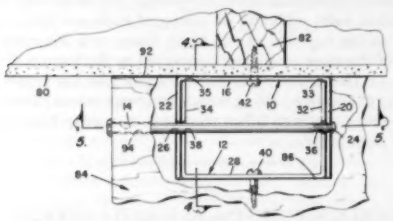
spacedly supporting each said buckle means from an overhead support and from other buckle means and for interconnecting each buckle means with an adjacent buckle means.

4,167,145

CANTILEVERED SHELF ASSEMBLY

Arthur A. Preslow, 1640 E. Edinger-Suite G, Santa Ana, Calif. 92705

Filed May 22, 1978, Ser. No. 908,506
Int. Cl.[2] A47B *5/00*
U.S. Cl. 108—152 **4 Claims**



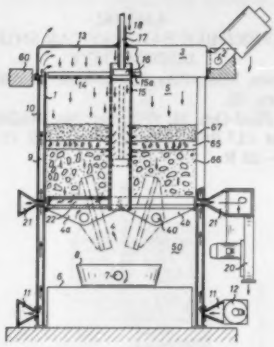
1. In a shelf assembly, the combination comprising:
a shelf having a long edge with at least one generally rectangular pocket formed therein;
a first genrally C-shaped clamp member having the bight portion thereof secured within said pocket, and the free end thereof extending toward the open end of said pocket;
a second generally C-shaped member configured for securing the bight portion thereof to a supporting surface with the arms thereof extending into said pocket in abutting aligned relation with the arms of said first C-shaped member;
an aperture in each arm of each of said first and second C-shaped members, said apertures being positioned for general alignment with said first and second C-shaped members in abutting aligned relation;
an aperture within said shelf in general alignment with the so-aligned apertures of said arms; and
pin means extending through said shelf aperture and through said arm apertures for securing said first and second C-shaped members to said shelf.

4,167,146

TRASH INCINERATING OVEN

Ernst Wirth, Zürich, Switzerland, assignor to Swissmechanic, Sektion Schwyz, Schwyz, Switzerland

Filed Nov. 21, 1977, Ser. No. 853,533
Claims priority, application Switzerland, Nov. 30, 1976, 15080/76
Int. Cl.[2] F23G *5/00;* **F23J** *1/00*
U.S. Cl. 110—251 **6 Claims**



1. An incinerating oven to incinerate a fill such as trash, refuse, waste material and the like having
a mantle (10) defining a combustion chamber therein;
a grating (4) delimiting the chamber at the bottom;
a movable lid closing the chamber at the top;
an air supply system (9–16) and an exhaust gas system (20, 21, 22) communicating with the chamber,
wherein, in accordance with the invention, the air supply system comprises
a channel section (13) located in the lid (3);
means (11, 12) supplying combustion air to said channel section;
perforate means (14) separating the channel section from the combustion chamber (5) to permit escape of combustion air from the channel section in the lid towards the top of the combustion chamber;
at least one piston-cylinder arrangement, the cylinder or cylinders (15) of which extend vertically through the combustion chamber and being formed by perforate tubes (15) in flow communication with the channel section (13) in the lid, and adapted to be surrounded by the fill within the combustion chamber;
a vertically adjustable piston (16) movable in the cylinder and having positioning means (17) extending through the lid to adjust the position of the piston within the cylinder and thereby control the flow of air from the channel section (13) in the lid through the perforate tube and through the perforations thereof and hence the level at which combustion air is being supplied to the fill within the chamber and permit supply of air at various levels thereto as the fill burns from the top down;
and the exhaust gas system comprises a flow connection between the combustion chamber (5) and the exhaust gas system (20, 21, 22) located in the vicinity of the grating.

6. Method of incinerating trash, refuse, waste material and the like forming a fill for an incinerating oven having
a mantle (10) defining a combustion chamber therein;
a grating (4) delimiting the chamber towards the bottom;
a movable lid (3) closing the chamber at the top;
and an air supply system (9–16) and an exhaust gas system (20, 21, 22) communicating with the chamber;
wherein the air supply system comprises a channel section (13) located in the lid;
means (11, 12) supplying combustion air to said channel section;

perforate means separating the channel section from the combustion chamber;

at least one piston-cylinder arrangement, the cylinder or cylinders (15) of which extend vertically through the combustion chamber and being formed by a perforate tube in flow communication with said channel section and adapted to be surrounded by the fill within the combustion chamber;

a vertically adjustable piston (16) movable in the cylinder and having positioning means (17) extending through the lid to adjust the position of the piston within the cylinder;

and wherein the exhaust gas system comprises a flow connection between the combustion chamber (5) and the exhaust gas system (20, 21, 22) situated in the vicinity of the grating, said method comprising the steps of

moving the lid from closing position with respect to the chamber at least partially filling said chamber with said fill and reclosing the lid;

igniting the uppermost layer of said chamber;

and controlling air flow to the layers below the ignited layer by vertically adjusting the level of said piston (16) within the cylinder (15) formed by said perforate tube to be below the ignited layer and supply combustion air to the fill below said ignited layer.

4,167,147

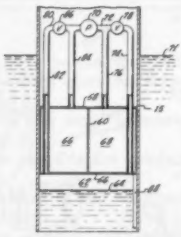
METHOD AND APPARATUS FOR STABILIZING A FLOATING STRUCTURE

Gunnar B. Bergman, Laguna Beach, Calif., assignor to SeaTek Corp., Goleta, Calif.

Continuation of Ser. No. 649,997, Jan. 19, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,700

Int. Cl.[2] B63B *43/14*

U.S. Cl. 114—122 **16 Claims**



3. The floating structure of claim 1 comprising first and second air chambers, said pump is connected to pump air from a first one of said chambers to a second one of said chambers thereby to maintain a pressure difference in said first and second chambers, a first valve controlled conduit connecting said first chamber to said ballast tank, a second valve controlled conduit connecting said second chamber to said ballast tank, and means responsive to said velocity sensing means and to the volume of water in said ballast tank for operating said valves to maintain the volume of water in said ballast tank relative to a mean volume as a predetermined function of sensed vertical velocity.

4,167,148

FLOATING APPARATUS AND METHOD OF ASSEMBLING THE SAME

Jose M. Fayren, Jose Fentanez 19 Pta., D. Puerta de Hierro, Madrid, Spain (35)

Filed Sep. 13, 1977, Ser. No. 832,849

Claims priority, application Spain, Sep. 13, 1976, 451.483

Int. Cl.[2] B63B *35/44*

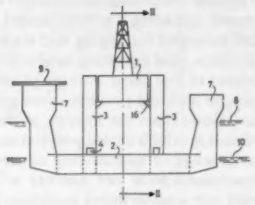
U.S. Cl. 114—265 **5 Claims**

1. In a floating apparatus of the semi-submersible type having two bottom hulls, a plurality of central pillars extending upwardly from said hulls, said central pillars each having an upper portion and at least one top hull connected to the upper portions of said central pillars, the improvement comprising:

said bottom and top hulls each comprising an elongate floating body,

said top hull extending transversely of said bottom hulls,

means for connecting said top hull to said central pillars at points laterally adjacent the upper portions of said central pillars,



outer pillar means, located at each end of said bottom hulls, for controlling the rocking movement and stability of the apparatus,

said outer pillar means having a cross section which decreases from each end toward an intermediate section thereof,

wherein the portions of said outer pillar means above said intermediate section are emergent while the portions therebelow are submerged in the working position and are emergent in the navigational position of the apparatus.

4,167,149

PNEUMATIC VALVE WITH ACOUSTIC ALARM FOR A RECIPIENT UNDER PRESSURE

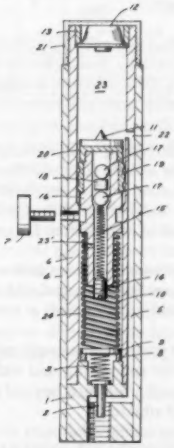
Bruno Lichtenstein, Rua Visconde do Herval, 967, Port Alegre, 90.000-RS-Brazil

Filed Oct. 7, 1977, Ser. No. 840,221

Claims priority, application Brazil, Oct. 27, 1976, 7607223

Int. Cl.[2] B60C *23/04*

U.S. Cl. 116—34 R **4 Claims**



1. An acoustic alarm arrangement associatable with a pneumatic tire for generating a signal indicating that pressure of gas in the tire decreases from a predetermined magnitude, comprising a housing arranged to be connected with a tire and bounding an inner chamber; a signal element associated with said housing and actuated under the action of a strike; and actuating means operative to strike said signal element in response to a decrease of pressure in the tire, said actuating means including

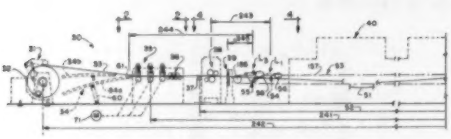
a striking element movable in said inner chamber between an inoperative position in which it is spaced from said signal element and an operative position in which it approaches and strikes the latter, said striking element subdividing said inner chamber into a first compartment located between said striking element and said signal element and communicating with the interior of the tire and a second compartment located at an opposite side of said striking element, said striking element having an inner passage extending between said compartments, said actuating means including a spring located in said second compartment and arranged for urging said striking element to said operative position, said actuating means further including valve means located in said inner passage of said striking element and movable to a closed position when gas at the predetermined pressure flows from the interior of the tire into said second compartment in which closed position said valve means closes said inner passage of said striking element and disconnects said compartments from one another whereby the gas admitted into said one compartment counteracts the force of said spring and retains said striking element in said inoperative position, and said valve means also being movable to an open position when gas under decreased pressure flows from the interior of the tire into said second compartment in which open position said inner passage is opened and said compartments communicate with one another so that gas flows further from said second compartment into said first compartment whereby gas pressures in said compartments become substantially equalized and said spring moves said striking element to said operative position.

4,167,150

SHEET METAL RIBBON COATING APPARATUS

Bernard H. Davis, Stoney Creek, Canada, and Thomas M. Welsh, Connersville, Ind., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Dec. 5, 1977, Ser. No. 857,678
Int. Cl.[2] B05C *1/08, 13/00*
U.S. Cl. 118—33 **21 Claims**



1. In apparatus for threading a sheet metal ribbon along a pass line extending from an uncoiling roll through at least one work station to a recoiling roll to establish and maintain a long-span catenary in said ribbon with significantly reduced waste at the leading end of said ribbon, the combination comprising:

entry roll means positioned between said uncoiling roll and said work station, operable to impel said ribbon along said pass line toward said recoiling roll at a substantially constant speed;

a first ribbon support positioned between said entry rolls and said work station for supporting said ribbon;

a second ribbon support positioned beyond said work station for supporting said ribbon;

tension control means comprising pairs of opposed tension rolls positioned beyond said second ribbon support, adapted to grip and pull said ribbon along over said second ribbon support, the nips of said tension rolls residing substantially in a common plane;

gripper means positioned at a first location adjacent to said first ribbon support for gripping said leading end of said sheet metal ribbon;

transport means operable to move said gripper means and said leading end of said ribbon along said pass line from said first location, through said work station, and between said tension rolls to a second location beyond said tension rolls;

motor means operable to urge said opposed tension rolls apart to permit passage of said gripper means and said ribbon therebetween, and thereafter to urge said opposed tension rolls together thereby to apply gripping pressure to said ribbon after passage of said gripper means;

release means at said second location for disengaging said leading end of said ribbon from said gripper means; and

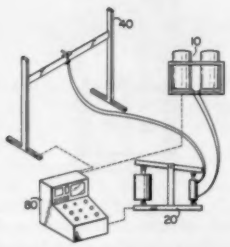
drive means operable to drive said transport means in interdependent relation with said entry rolls thereby to move said gripper means and said ribbon through said work station at said substantially constant speed until said gripper means passes between said tension rolls and until said tension rolls grip and move said ribbon thereby establishing said catenary, and thereafter to drive said tension rolls in interdependent relation with said entry rolls to maintain a selected sag in said catenary while moving said ribbon through said apparatus at said substantially constant speed.

4,167,151

AUTOMATIC SPRAYING APPARATUS FOR FORMING HARD POLYURETHANE FOAM COATING

Mamoru Muraoka, Yokohama; Kikuo Shimada, Yokosuka; Hiroshi Komada, Kobe, and Toshiyuki Gami, Akashi, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo and Nihon Soflan Chemical & Engineering Co. Ltd., Osaka, both of, Japan

Continuation-in-part of Ser. No. 614,967, Sep. 19, 1975, abandoned. This application Feb. 15, 1978, Ser. No. 877,965
Claims priority, application Japan, Nov. 1, 1974, 49-125354
Int. Cl.[2] B05C *5/00, 11/10*
U.S. Cl. 118—665 **6 Claims**



1. An automatic spraying apparatus comprising storage tanks, each storing therein one of at least two liquid components which are mixed to produce hard urethane foam; a pump for feeding said each liquid component under pressure; a spray gun for mixing said liquid components fed from said pumps and spraying the mixture; a means displacing said spray gun in a plane spaced apart from and substantially in parallel with a surface to be sprayed, said means comprising a traverse bar, a carriage having mounted thereon said spray gun and being movably mounted upon said traverse bar, a first motor for moving said carriage along said traverse bar, a second motor for displacing said traverse bar in a direction perpendicular to the axis of the said traverse bar in said plane, a first pulse generator for issueing pulse signals the number of which corresponds to the displacement of said carriage, a second pulse generator for issueing pulse signals the number of which corresponds to the displacement of said traverse bar, a first control means in response to said pulse signals from said first pulse generator for reversing the rotation of said first motor when said carriage arrives at either end of said traverse bar, and a second control means for energizing said second motor at the same time as the rotation of said first motor is reversed and de-energizing said second motor in response to said pulse signals from said second pulse generator when the displace-

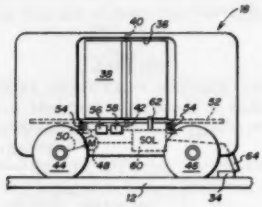
ment of said traverse bar after energization of said second motor reaches a predetermined level; and a pump control circuit comprising a flow meter for detecting the discharge rate of said each pump, means for combining output signals from said flow meters to produce the sum of the detected discharge rates of said pumps, means for dividing output signals from said flow meters to produce the ratio of the detected discharge ratio of said pumps, a first comparator means for comparing said sum of the detected discharge rates with a predetermined total discharge rate of said pumps, a second comparator means for comprising said ratio of the detected discharge rates with a predetermined ratio of discharge rates of said pumps, and means operating in response to output signals from said first and second comparator means and for controlling the discharge rate of said each pump at a predetermined rate determined from said predetermined total discharge rate and said predetermined discharge ratio.

4,167,152

PLAY APPARATUS FOR LIVE ANIMAL

Brendon W. Mills, 9417 Trailhill Dr., Dallas, Tex. 75238

Filed Jan. 23, 1978, Ser. No. 871,695
Int. Cl.[2] A01K *1/00*
U.S. Cl. 119—15 **7 Claims**



1. Apparatus to allow the movement of a live animal between a plurality of spaced apart play areas comprising:
- a continuous track,
- a plurality of animal play areas communicating with spaced points of said track,
- a wheeled vehicle operable for moving in one direction along said track,
- motor means contained in said vehicle for causing movement of said vehicle,
- means for allowing entrance of the animal into said vehicle when said vehicle is stationary adjacent one of said play areas,
- means responsive to the presence of the animal within said vehicle for energizing said motor means to cause movement of said vehicle along said track,
- means adjacent each of said play areas for causing termination of movement of said vehicle proximate to said play area,
- means for preventing exit of the animal from said vehicle while said vehicle is in motion, and
- means for allowing exit of the animal from said vehicle when said vehicle is stopped adjacent one of said play areas.

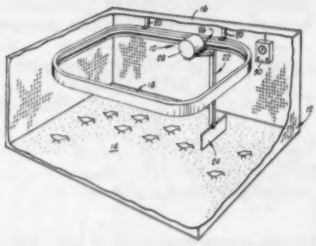
4,167,153

METHOD AND APPARATUS FOR IMPROVING POULTRY FEED CONVERSION

Donnie D. Markum, 407 N. E St., Duncan, Okla. 73533

Filed Jan. 10, 1977, Ser. No. 757,938
Int. Cl.[2] A01K *39/00*
U.S. Cl. 119—51 R **3 Claims**

1. A method of improving the feed conversion of poultry confined within a poultry raising house which comprises the steps of:
- maintaining feed and water for said poultry at a feed location within said house;
- periodically moving a baffle along the floor of said house in a manner whereby said poultry therewithin are disturbed and forced to move to said feeding location, said step of periodically moving said baffle including:
- providing a guide rail having a movable carriage attached



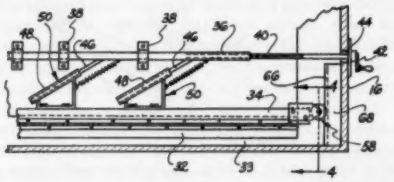
thereto within said house, said carriage having said baffle connected thereto; and
- periodically causing said carriage to move along said guide rail whereby said baffle is moved over substantially the entire floor area of said house.

4,167,154

ANIMAL FEEDER

Forest L. Hill, Rte. #1, Box 146, Hillsboro, Ohio 45133

Filed Nov. 4, 1977, Ser. No. 848,467
Int. Cl.[2] A01K *5/00*
U.S. Cl. 119—53 **4 Claims**



1. An improved animal feeder of the type having a storage bin area disposed above a feed discharge area and enclosed within a frame which is provided with a feed discharge opening at its lower end communicating with a feed trough which includes at least one gate member vertically movable to vary the size of said feed discharge opening; the improvement comprising actuator means for varying the vertical position of said movable gate member and including a horizontally disposed actuator rod mounted within said frame adjacent to said feed discharge area for horizontally shiftable movement at a position above said movable gate member; said rod provided with at least one downwardly extending member inclined at a predetermined angle relatie to the horizontal, which is telescopically associated with a similarly inclined member fixed to said movable gate member whereby the horizontal movement of said actuator bar effects a vertical component of force on said gate member.

4,167,155

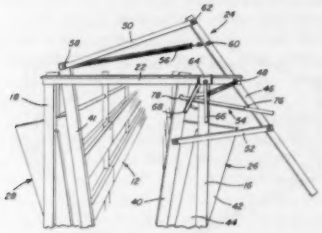
AUTOMATIC ANIMAL HEADGATE WITH BOTTOM HINGED GATES

Jerry D. Wade, Rte. #2, Box 76, and Phillip H. Geisler, Rte. #1, Box 40, both of Galena, Kans. 66739

Continuation-in-part of Ser. No. 718,037, Aug. 26, 1976, Pat. No. 4,100,886. This application Aug. 18, 1977, Ser. No. 825,851
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—98 **9 Claims**

1. An automatic headgate for animals, comprising a rigid frame, gate means mounted on the frame for displacement

between an open position and a closed position, force-applying means rendered operative in the open position of the gate means for biasing the gate means to the closed position, a pair of releasable lock devices for respectively preventing displacement of the gate means from each of said open and closed positions, and means responsive to opening pressure applied to the gate means in the open position thereof for releasing one of the lock devices to permit closing of the gate means under the bias of the force-applying means.

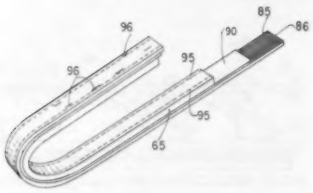


4,167,156

REFLECTIVE ANIMAL LEASH

Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.

Filed Jul. 11, 1977, Ser. No. 814,191
Int. Cl.[2] A01K *27/00*
U.S. Cl. 119—109 **6 Claims**



1. An animal leash comprising an elongated leather strip having an attachment end and a handle, a transparent polyvinyl chloride elongated and flexible strip having a prism design on one surface thereof for reflecting light therefrom, an opaque polyvinyl chloride flexible strip secured to the one surface of the transparent strip and coextensive in length therewith, a plurality of stitches securing said leather strip and said combined polyvinyl chloride strips with the leather and opaque strips abutting, said stitching extending longitudinally of said strips and providing crinkled surfaces in said transparent polyvinyl chloride strip to increase the reflective angle thereof.

4,167,157

FLUID-BED AIR-SUPPLY SYSTEM

Edward A. Zielinski, Harwinton, and Joseph R. Comparato, Bloomfield, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 13, 1978, Ser. No. 895,888
Int. Cl.[2] F22B *1/02;* **F23D** *19/02*
U.S. Cl. 122—4 D **12 Claims**

1. In a fluidized-bed zone comprising a distributor plate that supports bed material and is perforated to form a first set of holes that permit a flow of air therethrough for fluidization of the bed material and support of combustion in the zone, the zone further comprising an air-supply system that comprises:

means, having an air inlet and an air outlet, for providing and air-pressure increase from the inlet to the outlet;

a main air-conduit means having an inlet arranged in fluid communication with the outlet of the pressure-increase means and having an outlet connected to the distributor plate in such a manner that air leaving the outlet of the main air-conduit means flows through the first set of holes and the distributor plate to the bed material, the pressure-increase means thereby tending to cause a flow of air through the main air-conduit means and the distributor plate to the bed material;

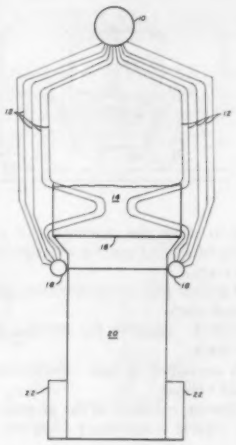
a bypass air-conduit means having an inlet arranged in fluid communication with the outlet of the pressure-increase means and having an outlet so positioned that air leaving the outlet flows into the bed material without passing through the first set of holes; and

means for restricting air flow through the bypass conduit means, when the flow-restriction means is operated, without restricting flow in the main conduit means, operation of the flow-restriction means thereby tending to restrict to the main conduit means the air flow between the pressure-increase means and the bed material,

the improvement wherein:

a. the distributor plate is further perforated to form a second set of holes therethrough;

b. the outlet of the main conduit is connected to the distributor plate in such a manner that air leaving the outlet of the main conduit flows through the first set of holes in the distributor plate without flowing through the second set of holes; and



c. the outlet of the bypass conduit is connected to the distributor plate in such a manner that air leaving the outlet of the bypass conduit flows through the second set of holes without flowing through the first set of holes.

5. In a fluidized-bed system comprising a plurality of zones, each zone comprising a distributor plate that supports bed material and is perforated to form a first set of holes that permit a flow of air therethrough for fluidization of the bed material and support of combustion in the zone, the system further comprising an air-supply system that comprises:

means, having an air inlet and an air outlet, for providing an air-pressure increase from the inlet to the outlet;

a plurality of main air-conduit means, each zone being associated with one of the main air-conduit means, each of the main air-conduit means having an inlet arranged in fluid communication with the outlet of the pressure-increase means and having an outlet connected to the distributor plate of its associated zone in such a manner that air leaving the outlet of each of the main air-conduit means flows through the first set of holes in its associated distributor plate to the bed material in its associated zone, operation of the pressure-increase means thereby tending to cause a flow of air through the main conduit means and their

associated distributor plates to the bed material in their associated zones; and

at least one bypass air-conduit means, each of at least a chosen one of the zones being associated with the bypass air-conduit means, each bypass means thereby being associated with one of the main conduit means, each bypass conduit means having an inlet arranged in fluid communication with the outlet of the pressure-increase means and having an outlet so positioned that air leaving the outlet of the bypass conduit means flows into the bed material in its associated zone without passing through the first set of holes through which its associated main conduit means communicates with the bed material,

the improvement wherein:

a. the distributor plates of the chosen zones are further perforated to form second sets of holes therethrough;

b. the outlets of the main conduit means associated with the chosen zones are connected to the distributor plates of their associated zones in such a manner that air leaving the outlets of such main conduit means flows through the first sets of holes in their associated distributor plates without flowing through the second sets of holes therethrough; and

c. the outlets of the bypass conduit means are connected to the distributor plates of their associated zones in such a manner that air leaving the outlets of the bypass conduit means flows through the second sets of holes in the distributor plates of their associated zones without flowing through the first sets of holes therethrough.

4,167,158

FUEL INJECTION APPARATUS

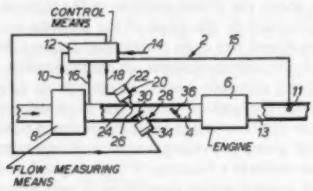
Barrie J. Martin, Shenfield, and Samuel S. Hall, Hornchurch, both of England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Filed Jan. 14, 1977, Ser. No. 759,476

Claims priority, application United Kingdom, Jan. 14, 1976, 1458/76; Apr. 22, 1976, 16419/76

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **5 Claims**



1. A fuel injection apparatus for an engine of a vehicle comprising a fuel injector positioned in a duct of the engine, a thin plate defining a surface positioned in the duct of the engine to receive fuel injected from the fuel injector, means for vibrating said fuel injector for injecting atomized fuel toward the surface of said thin plate, means for vibrating said thin plate wherein the vibrations are in the longitudinal plane of the plate, said thin plate being sufficiently thin so that said vibrations are in the longitudinal plane of the plate, wherein fuel particles that are insufficiently atomized by the fuel injector are further atomized by the vibrating surface of said plate, air flow measuring means comprising a vortex shedding flow meter which measures at least a part of the flow of air for an engine and which generates an electrical output that is proportional to the measured air flow, and wherein said means for vibrating said fuel injector comprise control means which receives the output from the vortex shedding flow meter and which generates electrical output signals which vary in dependence upon the received signals, means for interconnecting said control means with said injector for activating the injector by a number of times in any given period directly proportional to the number of vortices shed by the vortex shedding flow meter, and fuel dissipating means for dissipating at least a part of the injected fuel.

4,167,159

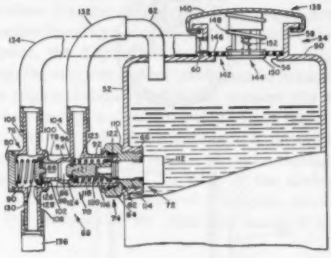
PRESSURIZED LIQUID COOLING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Bruce L. Warman, Silvis, Ill., assignor to Deere & Company, Moline, Ill.

Filed Apr. 29, 1977, Ser. No. 792,211

Int. Cl.[2] F01P *7/14*

U.S. Cl. 123—41.08 **33 Claims**



1. In an internal combustion engine having a plurality of operating parameters and a cooling system including a liquid coolant contained in an enclosure, the fluid pressure in said enclosure varying with coolant temperature, the improvement comprising:

valve means in fluid communication with the enclosure for relieving enclosure pressure when said pressure exceeds a predetermined variable maximum greater than atmospheric and including a first pressure relief valve for limiting enclosure pressure to an upper maximum and a second pressure relief valve for relieving enclosure pressure at a level less than or equal to the upper maximum; and

control means operatively associated with the second valve and responsive to at least one engine operating parameter for controlling the second valve so that a given level of the parameter predetermines a given enclosure maximum pressure.

4,167,160

TWO CYCLE LOOP SCAVENGING ENGINE HAVING UNEQUAL SCAVENGING PASSAGE OPENINGS

Yukio Matsushita, and Kenichi Handa, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 14, 1978, Ser. No. 896,427

Claims priority, application Japan, Apr. 20, 1977, 52-50208[U]

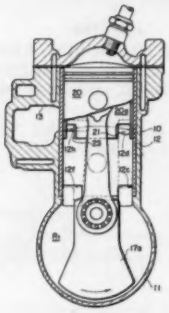
Int. Cl.[2] F02B *33/04*

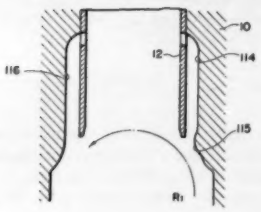
U.S. Cl. 123—73 A **5 Claims**

1. In a crankcase precompression type of two cycle engine including a cylinder block defining a cylinder therein, a skirted piston reciprocatingly and slidably disposed within the cylinder, a crankshaft including a crankweb rotatably mounted in a crankchamber beneath the cylinder block, a connecting rod coupling the piston to the crankshaft, and a pair of scavenging passages defined in the cylinder block for forceably venting precompressed fuel mixture from the crankchamber into the cylinder near the end of each power stroke of the piston, said passages being symmetrically disposed on opposite sides of a plane including the cylinder axis and lying at a predetermined angle unequal to zero with respect to a plane perpendicular to the crankshaft axis, whereby the rotation of the crankweb creates a higher pressure at an entrance of one scavenging

passage than at an entrance of the other scavenging passage, the improvement characterized by:

means for restricting the effective cross-sectional area of the





high pressure scavenging passage at at least one point thereof to thereby substantially equalize the fuel mixture charges forceably vented through the respective scavenging passages.

4,167,161

DIRECTIONAL AUXILIARY INTAKE INJECTION FOR INTERNAL COMBUSTION ENGINE

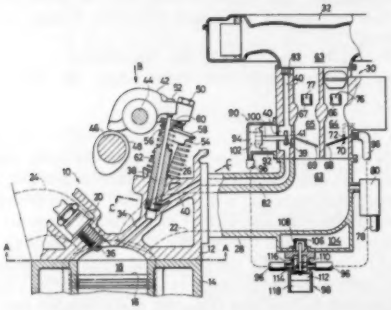
Tatsuro Nakagami, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 27, 1977, Ser. No. 810,452

Claims priority, application Japan, Jul. 9, 1976, 51-82388; Dec. 8, 1976, 51-147511

Int. Cl.[2] F02M *23/04, 7/00*

U.S. Cl. 123—75 B **12 Claims**



1. An internal combustion engine, comprising: a spark plug gap within a combustion chamber; an auxiliary injection port having a directional outlet adjacent the spark plug gap for injecting a charge of a gas such as air, lean fuel mixture, or exhaust gas; a main intake passage for supplying fuel mixture to the combustion chamber via a main intake valve; a throttle valve disposed in the main intake passage for controlling the fuel mixture flow rate; an auxiliary intake passage communicating with the injection port and disposed independently of the main intake passage; a valve disposed within the auxiliary intake passage; and means for controlling said valve in response to the movements of the throttle valve such that said valve is opened to a maximum degree when the throttle valve is opened to an intermediate position, to thereby enhance the swirling effect within the combustion chamber and improve the combustibility of the mixture within the chamber over a wide range of engine running conditions, including idling and light load operation.

4,167,162

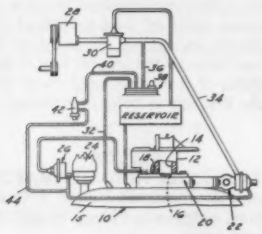
ENGINE IGNITION TIMING CONTROL

Ahmet R. Akman, Farmington, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 4, 1977, Ser. No. 848,637

Int. Cl.[2] F02P *5/10*

U.S. Cl. 123—117 A **8 Claims**



1. An ignition timing control for an internal combustion engine having a carburetor mounted thereon having an induction passage and a throttle valve movable across the passage to control the flow of an air/fuel mixture therethrough to the intake manifold of the engine, a pressure port opening into the passage above the closed position of the throttle valve adapted to be traversed by the edge of the throttle valve as it moves between closed and open positions to subject the pressure port to manifold vacuum changes, an engine ignition timing distributor having movable means movable in an advance direction to advance the ignition timing and in an opposite direction to return the ignition timing to its initial timed position, an engine driven air pump providing a source of superatmospheric pressure that varies as a function of engine speed, and fluid pressure actuated control means connected to said movable means and responsive to the application of the fluid pressure from the pressure port and the air pump independently or concurrently to move the movable means to effect advance of the engine timing by various degrees, said control comprising a servo mechanism having a housing, a movable flexible diaphragm, connecting means operably connecting the movable means and diaphragm, the diaphragm together with the housing defining a first fluid chamber connected to the pressure port for moving the diaphragm and movable means in an advance direction upon increases in the manifold vacuum, first spring means biasing the diaphragm in an opposite direction, the operable connection between the diaphragm and movable means including other means connected to the movable means and normally engaged with the connecting means for concurrent movement of the connecting means and movable means to advance the ignition timing as a function of pressure port vacuum changes, second spring means biasing the other means and connecting means together, and further means responsive to superatmospheric pressure for moving the other means in an advance direction relative to the connecting means to move the movable means to advance the timing relative to the pressure port timing changes.

4,167,163
SENSOR MONITORING APPARATUS

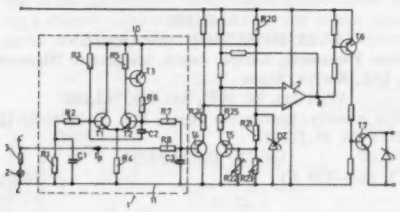
Helmut Möder, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 24, 1977, Ser. No. 780,748

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1976, 2612915

Int. Cl.² F02M *7/00*; G01N *31/00*

U.S. Cl. 123—119 EC **14 Claims**



1. A method for turning on and/or off a regulatory means operating with an oxygen sensor which is part of a control loop and which detects a given operational state (actual value) during the mixture preparation for motor vehicles, whereby the sensor requires a period of time which is indeterminable before reaching its operating temperature and full function during the operation of a fuel injection apparatus in which the sensor is disposed in the exhaust gas channel and influences the function of the injection apparatus, which includes one of either the duration of the injection pulses generated the secondary air supply on the exhaust side, the improvement comprising the steps of:

passing a test current through said sensor;

detecting the voltage drop across said sensor due to the passage of said test current;

comparing said voltage drop with a predetermined set-point value;

opening the control loop when said comparison shows that the internal resistance of said sensor is too high; and

closing the control loop and cutting off said test current when said comparison shows that the internal resistance of said sensor is sufficiently low to provide an adequate control signal to said control loop; whereby said test current is prevented from falsifying the control signal from said sensor in normal operation.

4,167,164
CRANKCASE VENTILATION VALVE FOR INTERNAL COMBUSTION ENGINES

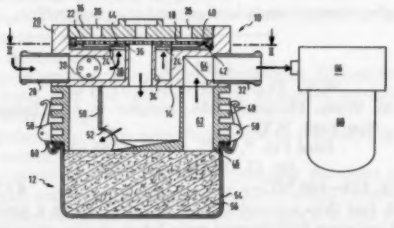
Max Bachmann, Austrasse 7, CH-8951 Fahrweid-Zurich, Switzerland

Filed Jan. 25, 1978, Ser. No. 872,057

Claims priority, application Switzerland, Jan. 31, 1977, 1152/77

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 B **11 Claims**



1. Crankcase ventilation valve for internal combustion engines with a valve casing which is divided into a first and a second chamber by a displaceable wall sealingly attached at the periphery, wherein the first chamber is in communication with the atmosphere and the second chamber is in communication on the one hand through an inlet tube with the crankcase and on the other hand through an outlet tube with the suction device by way of a cylindrical tubular member disposed in the second chamber, the displaceable wall and the tubular member being constructed as a non-return valve and the valve seat being surrounded by a concentric ring space which is connected to the inlet tube, wherein the displaceable wall is constructed as a diaphragm of a very light, elastic material; a support surface for the diaphragm is arranged around the tubular member forming the valve seat face, above the concentric ring space, the diaphragm extending to the edge of the valve casing; the support surface comprises an annular groove at the outer edge and radially extending support ribs which are arranged at a spacing and which extend from the concentric ring space, and wherein the diaphragm is arranged in the annular groove for providing tension and in its closing position rests on the support ribs and the ratio of the surface of the diaphragm loaded by the pressure of the suction device to that loaded by the pressure of the crankcase amounts to at least 1:10.

4,167,165
FUEL VAPORIZERS FOR INTERNAL COMBUSTION ENGINES

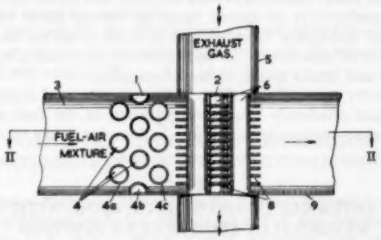
Ian C. Finlay, and George R. Gallacher, both of Glasgow, Scotland, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jul. 16, 1976, Ser. No. 705,890

Claims priority, application United Kingdom, Jul. 18, 1975, 30319/75

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 AA **12 Claims**



1. A self-regulating fuel vaporiser comprising a fuel-air conduit adapted for series connection between a carburetor and an inlet manifold of a spark ignition engine, and including a heat exchanger having a plurality of mutually parallel vaporiser tube transversely intersecting a region of said fuel-air conduit, and adapted in parallel flow arrangement for series connection with an exhaust conduit of said engine, a plurality of mutually parallel, planar vaporising fins disposed within said region of said fuel-air conduit in a direction normal to said vaporiser tubes, each fin occupying the full width of the surrounding conduit and each fin being intersected by and thermally coupled with every one of said vaporiser tubes, said region of said fuel-air conduit being additionally intersected by a thermally insulated exhaust by-pass tube arranged in parallel flow connection with said vaporiser tubes and transversely intersecting each of said vaporising fins.

4,167,166

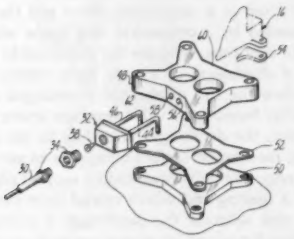
HOT AIR VAPORIZATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

William L. Varner, and Billy R. Willis, both of Scottsdale, Ariz., assignors to Mileage Research, Ltd., Phoenix, Ariz.

Filed Oct. 11, 1977, Ser. No. 841,314

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—122 D **11 Claims**



1. A hot air vaporization system for an internal combustion engine of the type including a carburetor having venturi passages, an intake manifold having respective branch cavities, each receiving a fuel-air mixture from a respective carburetor venturi passage for induction into the engine, said hot air induction system comprising:

an air induction type open to receive air;

heating means heating the inducted air passing through said air induction tube;

metering block means and means connecting said air induction tube to said metering block means and further including means for metering the air flow therethrough;

a pair of distributor spaced tubes each connected to said metering block means and receiving said metered air flow therefrom, each of said distributor tubes extending into said intake manifold through respective central regions of each of said intake manifold branch cavities immediately below said venturi passages and each of said distributor tubes having ends disposed in said intake manifold and further including means for creating a diffuse flow of heated air from each of said distributor tubes into each of said intake manifold branch cavities, said means including a multiplicity of spaced openings formed about each of said distributor tubes such as to cause a diffuse outward flow of heated air from said tubes into said central regions of said intake manifold branch cavities;

whereby said diffused flow of hot air into said central regions efficiently causes vaporization of the fuel in said fuel-air mixture received into said engine intake manifold.

4,167,167

INTERNAL COMBUSTION ENGINE WITH EXTERNALLY CONTROLLED IGNITION

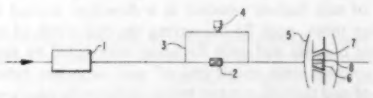
Jörg Abthoff, Plüderhausen; Hans-Dieter Schuster, Schorndorf; Dag-Harald Hüttebräucker, Weinstadt; Reiner Kreeb, and Marijan Laszlo, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 2, 1976, Ser. No. 673,137

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1975, 2514483

Int. Cl. F02m *39/00*

U.S. Cl. 123—139 ST **23 Claims**



1. An internal combustion engine with applied ignition and fuel injection means for improving the exhaust gas emission during the warm-up of the engine, characterized by means for subdividing the warm-up phase of the engine into mutually independent nonnegative phases, said subdividing means including an independently adjustable control means for discontinuously controlling the control pressure of the fuel injection means in dependence on at least one different parameter and for producing only positive jumps in the characteristic curve thereof.

4,167,168

FUEL INJECTION APPARATUS

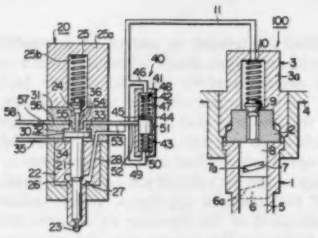
Yoshihisa Yamamoto, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 24, 1977, Ser. No. 762,168

Claims priority, application Japan, Feb. 5, 1976, 51-11712; Feb. 27, 1976, 51-21318

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—139 AT **16 Claims**



1. A fuel injection apparatus for a internal combustion engine including means for intermittently feeding a fuel under a high pressure and a fuel injection valve apparatus for intermittently injecting the high pressure fuel into an associated combustion chamber of said internal combustion engine, wherein said fuel injection valve apparatus comprises:

(a) a valve housing communicated with said feeding means and formed with at least one injection orifice,

(b) a needle valve element, slidably fitted in said valve housing, for opening and closing said injection orifice, said needle valve element being actuated by the high pressure fuel fed from said feeding means thereby to open said injection orifice for injecting the high pressure fuel,

(c) means, operatively coupled to said needle valve element, biasing said element to close said injection orifice so that said needle valve element closes said injection orifice when the feed of the high pressure fuel from said feeding means is intermitted, and

(d) means, operatively coupled to said needle valve element, for hydraulically thrusting said needle valve element in the orifice closing direction in cooperation with said biasing means, said thrusting means including means for accumulating the high pressure fuel fed from said feeding means so that the accumulated fuel thrusts said needle valve element in the closing direction when the needle valve element tends to close said injection orifice.

4,167,169

FUEL FLOW CONTROL SYSTEM

Jack M. White, Florissant, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,190

Int. Cl.[2] F02D *1/04, 1/06*

U.S. Cl. 123—140 MC **8 Claims**

1. A fuel flow control system for maintaining a predetermined optimum fuel-air mass ratio for an engine comprising:

electronic circuitry means for generating a command signal at least in part representative of the volume flow of air

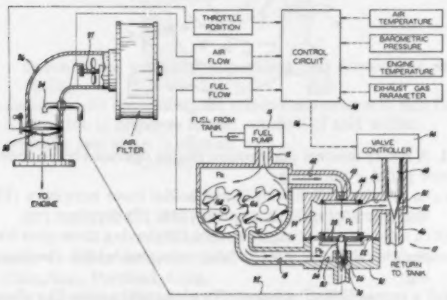
drawn into said engine through a carburetor throttle body;

a fuel flow passageway adapted to be pressurized by a fuel pump;

metering valve means in said fuel flow passageway for regulating the fuel flow rate through said passageway; and

control means responsive to said command signal for controlling the operation of said metering valve means;

said control means including a differential pressure mechanism movable in response to a change in pressure differential between a control pressure and the pressure of said fuel in said passageway, said control means further including a control valve movable in response to said command signal to adjust said control pressure, said differential



pressure mechanism including a diaphragm attached to said metering valve means, one sid of said diaphragm being subjected to said control pressure and the opposite side of said diaphragm being subjected to the pressure of said fuel within said passageway, and spring means acting on said diaphragm to urge said metering valve means into a closed position when said engine is turned off, and a control chamber at least partially defined by said one side of said diaphragm, a fuel flowmeter in said passageway located upstream of said metering valve means, and a restricted fuel passage extending between said control chamber and a point in said fuel flow passageway located upstream of said flowmeter; and

said metering valve means being positionable in response to movement of said differential pressure mechanism.

4,167,170

TURN-OFF PROTECTED IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Gerhard Söhner, Remshalden, and Helmut Roth, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 855,937

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1976, 2654413

Int. Cl.² F02B *1/02*

U.S. Cl. 123—148 E **10 Claims**

1. Turn-off protected ignition system for internal combustion engine, having

a source of electrical supply **(1)**;

a main switch **(2)** connecting the source **(1)** to the ignition system, said system having

an ignition coil **(8)**;

a main ignition current supply transistor **(9, 12)** connected in series with said ignition coil **(8)** to control current flow therethrough;

a pulse source **(25)** providing pulses to command ignition events;

a control transistor **(36)** interconnecting the pulse source **(25)** and the main transistor **(9, 12)** to control conduction thereof in accordance with pulses applied to said control transistor **(36)**;

a coupling transistor **(41)** connected between said control transistor **(36)** and said main transistor **(9, 12)**, said coupling transistor being connected to be in blocked condition when said main transistor **(9, 12)** is conductive,

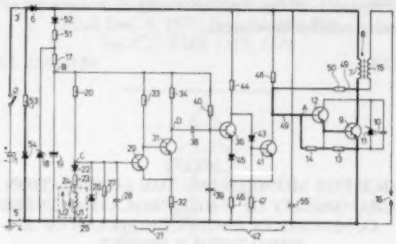
and comprising, in accordance with the invention,

a turn-off protection circuit **(49)** including

a stabilized voltage circuit including a coupling element **(51)** connected to said source, a Zener diode **(18)** connected to the coupling element **(51)**, and a stabilized-voltage current coupling element **(17)** connected to the junction of said coupling element **(51)** and the Zener diode **(18)** and providing a stabilized source **(B)** of current when connected to said electrical supply source **(1)**,

said control transistor being supplied from said stabilized voltage circuit;

a transistor coupling resistor **(50)** connected to the junction between the primary **(7)** of the ignition coil and the main transistor **(9, 12)** and further to the control electrode of



the main transistor to supply operating voltage to the main transistor from energy stored in the coil **(8)** to hold the main transistor in conductive condition during decay of voltage in the coil upon interruption of said main switch if, at the moment of interruption, said main transistor was conductive;

energy storage means **(19)** connected to the stabilized-voltage current coupling element **(17)** to supply energy to the stabilized voltage circuit in the absence of power supplied from said source of electrical supply **(1)** to hold the coupling transistor **(41)** in blocked condition and prevent bypassing of the energy from said coil through said coupling transistor;

and means **(6, 53, 54)** establishing a closed circuit for current flow due to the stored energy in the coil **(8)** independent of said switch **(2)**.

4,167,171

POSITIVELY LUBRICATED DISTRIBUTOR CONSTRUCTION FOR INTERNAL COMBUSTION ENGINES

Jörg Issler, Stuttgart; Helmut Funke, Korntal-Münchingen, and Klaus Schmidt, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 8, 1977, Ser. No. 804,772

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1976, 2630220

Int. Cl.² F01M *1/26*

U.S. Cl. 123—196 R **9 Claims**

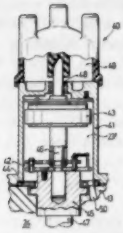
1. In an internal combustion engine having a rotating shaft **(47, 65)**, and an engine lubrication system which comprises an oil mist system providing oil mist in the engine compartment, a positively lubricated distributor comprising

a housing **(11, 41, 61)** secured to the engine block **(13)** of the internal combustion engine,

relatively movable components including a distributor shaft **(16)** within the housing driven from the rotating shaft **(47, 65)** of the internal combustion engine,

wherein the distributor is connected to the engine to be in open fluid communication with the engine compartment

to be exposed to the oil mist arising in the engine compartment during operation thereof and includes



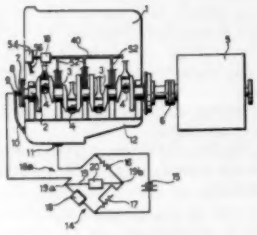
fluid connection means (50) in fluid communication with the lubricating system of the engine connected to movable components of the distributor subject to mechanical wear under relative movement.

4,167,172

DEVICE FOR MONITORING THE LUBRICATION OF THE CRANKSHAFT OF A RECIPROCATING INTERNAL COMBUSTION ENGINE BY MEANS OF A WHEATSTONE BRIDGE

Cesare Bassoli, and Giorgio Cornetti, both of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Jan. 25, 1978, Ser. No. 872,293
Claims priority, application Italy, Feb. 21, 1977, 67383 A/77
Int. Cl.[2] F01M *1/00*
U.S. Cl. 123—196 S **7 Claims**



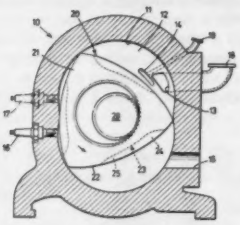
1. In a reciprocating internal combustion engine having a crankshaft, crankshaft bearings, a crankcase, and oil passages within the crankcase for the lubrication of the crankshaft bearings, a lubrication monitoring device comprising a measurement assembly made up of at least a first measurement unit formed by a first mean voltage measuring device and a second measurement unit connected in parallel with said first measurement unit and constituted by a threshold discriminator and a second means voltage measuring device connected to the output of said discriminator, wherein the improvement consists in the device further comprising a Wheatstone bridge having four arms, a measuring diagonal and a supply diagonal, the said measurement assembly being included in the measuring diagonal of said Wheatstone bridge, two of the arms of which consist of ordinary resistances while the other two arms comprise respectively a resistance-measuring reference cell which contains the same lubricating oil as the engine and provides a reference resistance, and a resistive circuit having means connecting said resistive circuit electrically between the engine crankshaft and the engine crankcase, said resistive circuit including the engine lubribcating oil in the said lil passages.

4,167,173

ROTARY INTERNAL COMBUSTION ENGINE

Tadakatsu Iwami, No. 374, Shikisai, Himeji-shi, Hyogo-ken, Japan

Filed Jul. 18, 1977, Ser. No. 816,549
Claims priority, application Japan, May 6, 1977, 52/52360
Int. Cl.[2] F02B *53/04*
U.S. Cl. 123—219 **1 Claim**



1. A rotary internal combustion engine operated by an accelerator pedal, comprising:

(a) a housing (10) having a trochoidal inner periphery (11) with spark plug ignition means (16, 17) therein;

(b) a substantially triangular rotor (20) having three arch-like peripheral faces and rotatably mounted within the housing;

(c) a recess (23) of substantially elongated spoon-like shape in each of the peripheral faces of the rotor;

(d) a fuel port (13) for supplying fuel from a fuel source, in the housing in communication therewithin;

(e) a vacuum ignition advance connected to said spark plug ignition means;

(f) a diaphragm (34) operatively coupled to said vacuum ignition advance to be operated by the vacuum thereof; a piston (36) slidable within a cylinder (35) connected to the diaphragm (34);

(g) an elongated air intake port (14) in the side wall of the housing so as to be opened and closed by a side face of the rotor according to the rotation thereof, said air intake port being elongated and inclined in the direction of rotation of said rotor and so disposed at a relative position that it gradually moves towards the rear end portion of a combustion chamber which is defined by the inner periphery of the housing and each of the peripheral faces of the rotor;

(h) an air intake passage communicating with the cylinder;

(i) an air supply passage communicating with the cylinder and connected to said air intake port (14);

(j) a bypass (46) communicating the air intake passage with the air supply passage, a first valve means mounted in the bypass for adjusting the air flow passing therethrough, and a second valve means mounted in the air supply passage upstream of the conjunction of the bypass, the piston (36) being adapted and disposed to block communication between the air intake passage and the air supply passage through the cylinder when the vacuum is relatively low, while to permit communication when the vacuum is relatively high.

4,167,174

METHOD AND APPARATUS FOR ALIGNING THE STREETS OF A SEMICONDUCTOR WAFER

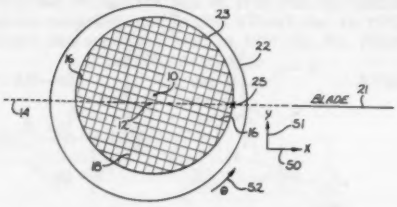
Gordon P. Hampton, Cupertino, and Matheus D. Pennings, Los Altos, both of Calif., assignors to General Signal Corporation, Stamford, Conn.

Filed Dec. 8, 1977, Ser. No. 858,719
Int. Cl.[2] B28D *1/04*
U.S. Cl. 125—13 R **10 Claims**

1. A method for aligning a street of a wafer comprising the steps of:

aligning a first street with a fixed reference by relative movement in a first linear direction;

aligning said first street with said reference as said street is moved relative to said fixed reference in a second linear



direction by manually controlling the rotation of said wafer;

automatically controlling the relative movement in said first direction in response to said rotation of said wafer;

whereby said street is aligned.

4,167,175

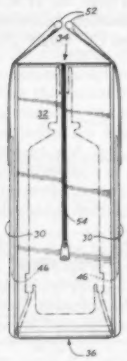
SELF-EXTINGUISHING HIBACHI-TYPE GRILL COMBINATION

Dannie G. Malafouris, Portland, Oreg., assignor to Barbecue Time, Inc., Portland, Oreg.

Filed Jan. 24, 1977, Ser. No. 762,051

Int. Cl.[2] A47J *37/00*; F24B *3/00*; F24C *1/16*

U.S. Cl. 126—25 C **1 Claim**



1. A self-extinguishing hibachi-type grill comprising, in combination:

(a) an hibachi-type grill having a pair of fuel trays secured pivotally to a base for adjustment between an operative position extending horizontally outward to opposite sides of said base and an inoperative, folded position extending vertically upward from said base, each tray having a superimposed solid-fuel retaining cooking support, the grill further having a pair of legs on the base which extend downward and outward from the base so that their bottoms are spaced apart a distance substantially greater than the corresponding width of the base and folded trays, and

(b) a fuel-extinguishing pouch of flexible, substantially air-tight sheet material dimensioned to contain the grill in its folded condition with burning solid fuel in the trays retained by the cooking supports, the pouch comprising:

(1) a pair of opposed side panels, a bottom panel and a top panel,

(2) stiff structural members secured to the inside of the bottom panel and lower portions of the side panels, the structural members on the side panels being spaced apart a distance substantially equal to the distance between the bottoms of the legs of the grill, for abutment of said bottom and side structural members by the bottoms of the legs of the grill, whereby to brace and position the folded grill so that its sides are maintained spaced inwardly from the side panels of the pouch,

(3) a sheet of fire resistant material secured to the inner surfaces of the side panels of the pouch above said stiff structural members,

(4) a longitudinal opening extending across the top panel and downward along the side panels sufficiently to pass the grill therethrough, and

(5) substantially air-tight closure means secured to the top and side panels along the margins of said opening for opening and closing the pouch.

4,167,176

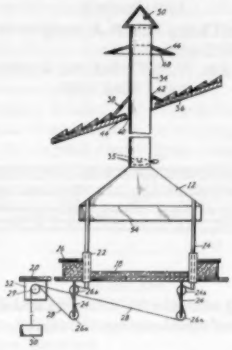
COMBINATION STOVE AND FIREPLACE

Paul E. Johnson, 4123 Jasper Rd., Springfield, Oreg. 97477

Filed Dec. 9, 1977, Ser. No. 859,156

Int. Cl.[2] F24B *1/18, 1/26*

U.S. Cl. 126—120 **4 Claims**



1. Apparatus for selectively converting an open-top fire pit into a stove comprising,

a fire hood,

leg means for supporting said fire hood, and

shifting means disposed adjacent and operatively connected to said leg means, selectively operable for raising and lowering said hood between a raised position in which the hood is spaced from the pit, and a lowered position in which the hood encloses the open top of the pit.

4,167,177

FIREPLACES

William H. Wiggins, 250 Don Park Rd., Unit 12, Markham, Ontario, Canada

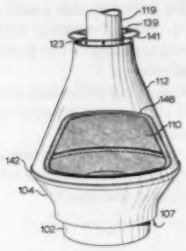
Continuation-in-part of Ser. No. 549,837, Feb. 13, 1976, abandoned. This application Sep. 7, 1976, Ser. No. 720,566

Int. Cl.[2] F24B *7/00*

U.S. Cl. 126—121 **4 Claims**

1. A fireplace comprising a fire-pan, a generally conical fire enclosure extending upwardly from the fire-pan to a flue and having a side opening, a generally frusto-conical casing concentrically surrounding the fire enclosure and having a side opening in register with the opening in the fire enclosure, and a fire door assembly rotatably supported concentricallly intermediate between the enclosure and the casing, said assembly comprising a frame having portions projecting above and outwardly of the top of the frusto-conical casing, a mesh screen and a fire door plate each supported by said frame and each bounding sufficient of the periphery of the conical enclosure to be rotatable into a position obturating the opening

therein, a sufficient portion of the periphery of the enclosure being unbounded by either the screen or the door plate to permit the frame to be rotated so that at least a substantial portion of the opening in the enclosure is unobturated.

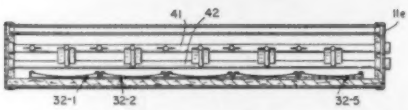


4,167,178

STATIONARY TYPE SOLAR ENERGY COLLECTOR APPARATUS

Nathan E. Brussels, Cherry Hill, N.J., assignor to Solar Energy Systems, Inc., Burlington, N.J.

Filed Jun. 27, 1977, Ser. No. 810,015
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—438 **13 Claims**



1. A solar energy collector for collecting and absorbing solar energy in the form of both beam type and diffuse type radiation comprising:

a housing having one transparent side;

a parabolic reflector within said housing facing said transparent side for reflecting beam type radiation passing through said transparent side;

an elongated fluid carrying element having its longitudinal axis substantially aligned with the focal line of said parabolic reflector, said elongated fluid carrying element being hollow and having a first substantially planar surface facing said parabolic reflector to receive and absorb radiation reflected from said reflector, said elongated fluid carrying element comprising a first fluid carrying element, and second and third fluid carrying elements positioned parallel to and on opposite sides of said first fluid carrying element, said second and third fluid carrying elements each having a first flat surface remote from said reflector and positioned over the longitudinal side edge thereof for collecting and absorbing diffuse type solar radiation passing through said transparent side and a second flat surface facing said parabolic reflector for absorbing heat resulting from convection currents developed between said fluid elements and said parabolic reflector.

4,167,179

PLANAR RADIOACTIVE SEED IMPLANTER

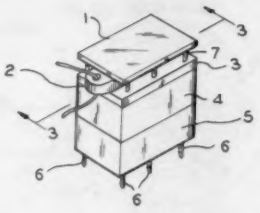
Mark Kirsch, 716 Shadylawn Rd., Lake Forest, Chapel Hill, N.C. 27514

Filed Oct. 17, 1977, Ser. No. 842,391
Int. Cl.[2] A61N *5/01*
U.S. Cl. 128—1.2 **5 Claims**

1. A radioactive seed applicator for implanting radioactive seed material in a planar array below the skin surface comprising:

a first stablizing structure;

a plurality of spaced-apart hollow needles extending from said first stablizing structure, said needles having tips arranged in a planar configuration;



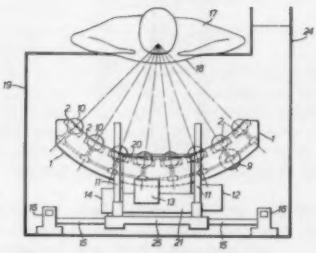
a matching array of spaced-apart trochars disposed for movement within said hollow needles whereby radioactive seed material disposed in said hollow needles is forced through said needles and implanted in a planar array at a predetermined depth below the skin surface when said needles are inserted through the skin.

4,167,180

METHOD AND APPARATUS FOR ULTRASONIC EXAMINATION

George Kossoff, Northbridge, Australia, assignor to The Commonwealth of Australia, care of the Department of Health, Phillip, Australia

Division of Ser. No. 681,037, Apr. 28, 1976, Pat. No. 4,094,306.
This application Mar. 23, 1978, Ser. No. 889,255
Claims priority, application Australia, May 1, 1975, PC1443
Int. Cl.[2] G01N *29/04*
U.S. Cl. 128—660 **2 Claims**



2. An apparatus for the ultrasonic examination of an object comprising: a liquid coupling bath; a plurality of transducers for directing pulses of ultrasonic energy along a beam axis through said liquid coupling bath and into said object and receiving echoes of said pulses reflected along said beam axis by acoustic impedance discontinuities in said object, said transducers being spatially positioned relative to each other and to the said object; means for steering the beam axis of each of said transducers to a plurality of angular directions in a single plane; and means for sequentially activating each of said transducers to direct a pulse of ultrasonic energy along a beam axis into the object and to receive echoes reflected along said beam axis in each of said angular directions at a rate sufficiently fast, compared to the rate of movement of the transducer beam, that each transducer beam axis moves only a small distance between successive activations of each respective transducer, said means for sequentially activating each of said transducers comprising means for activating non-adjacent transducers to direct a pulse of ultrasonic energy along a beam axis into the object substantially simultaneously with the receipt of echoes resulting from activation of the previously activated transducer.

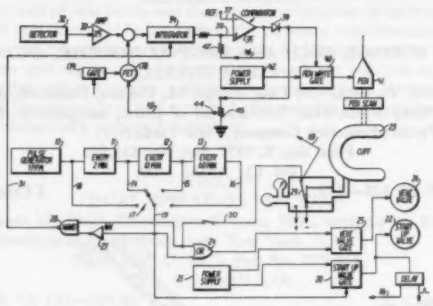
4,167,181
APPARATUS FOR AUTOMATICALLY DEPRESSURIZING A VARIABLE-VOLUME INFLATABLE ENCLOSURE

Arnold S. J. Lee, Englewood, N.J., assignor to Milstein Medical Research Foundation, Inc., New York, N.Y.

Division of Ser. No. 617,175, Sep. 26, 1975, Pat. No. 4,027,662, which is a continuation of Ser. No. 378,167, Jul. 11, 1973, abandoned. This application Mar. 18, 1977, Ser. No. 778,995

Int. Cl.² A61B *5/02*

U.S. Cl. 128—682 **3 Claims**



1. Apparatus for automatically depressurizing a variable-volume inflatable enclosure such as a cuff at a precisely constant rate, the apparatus comprising, in combination, a reference chamber having a fixed volume, means for pressurizing the reference chamber to a fixed value, means operable for pressurizing a variable-volume inflatable enclosure, means operative when the reference chamber has reached the fixed value for depressurizing the reference chamber at a precisely constant rate, vent valve means coupled to the enclosure and operable for depressurizing the enclosure, and control means coupled to the reference chamber, the enclosure pressurizing means and the vent valve means for selectively operating the enclosure pressurizing means and the vent valve means to maintain a predetermined difference in pressure between the reference chamber and the enclosure as the reference chamber is depressurized at the precisely constant rate.

4,167,182
MASSAGE APPARATUS

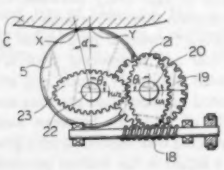
Yukio Yamamura; Takafumi Hamabe, and Haruo Sugai, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Feb. 22, 1978, Ser. No. 880,272

Claims priority, application Japan, Feb. 24, 1977, 52-19984

Int. Cl.² A61H *7/00*

U.S. Cl. 128—56 **8 Claims**



1. A massage apparatus comprising a rotary driving source, a driving shaft rotated by said driving source, a driving side gear fixed to said driving shaft, an operating shaft having a driven side gear fixed to said operating shaft and being in mesh with said driving side gear to operatively associate therewith, and massaging attachments driven in response to rotations of the operating shaft, said driving side and driven side gears being arranged to provide an unequal velocity ratio with which rotating velocity of the driven side gear is varied by rotations of the driving side gear, and said massaging attachments being operatively associated with the operating shaft so as to perform a pushing action when said rotating velocity of the driven side gear thus varied is small and to perform a releasing action when the velocity is large.

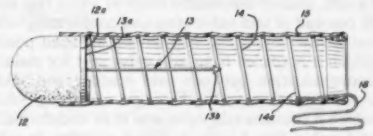
4,167,183
ANTI-RAPE DEVICE

Charles Barlow, 4426 E. 22nd St., Tucson, Ariz. 85711

Filed Sep. 29, 1977, Ser. No. 837,904

Int. Cl.² A61B *19/00*

U.S. Cl. 128—138 R **6 Claims**



1. An anti-rape device adapted to be inserted into the vaginal cavity of a human female, comprising a base member, elongated penis penetrating means attached to the base member to project outwardly toward the mouth of the vaginal cavity when the device is operationally positioned within the vaginal cavity of a human female, and retractable means normally surrounding said elongated penis penetrating means to protect the walls of the vaginal cavity from contacting said penis penetrating means, said retractable means being adapted to be retracted upon penetration of the vaginal cavity by a male penis to permit penetration of the penis by said penis penetrating means.

4,167,184
LUNG-VENTING APPARATUS

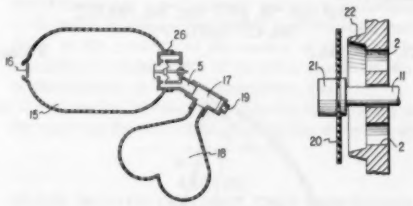
Ole B. Köhnke, Lyngby, Denmark, assignor to Ruth Lea Hesse, Rungsted Kyst, Denmark

Continuation-in-part of Ser. No. 614,953, Sep. 19, 1975, Pat. No. 4,071,025. This application Dec. 28, 1977, Ser. No. 865,598

Claims priority, application Sweden, Sep. 20, 1974, 7411883

Int. Cl.² A61M *16/00*

U.S. Cl. 128—145.7 **15 Claims**



1. In a manually operated lung-venting apparatus including a self-expanding bladder having a bladder inlet through which treating gas is drawn into the bladder during expansion thereof; a bladder outlet through which treating gas is driven out of the bladder during compression thereof and a three-way non-rebreathing valve having an inlet in communication with the bladder outlet, a first outlet to be connected to the respiratory system of a patient, a second outlet communicating with the surrounding atmosphere and means providing one-way flow from said inlet to said first outlet and from said first outlet to said second outlet during lung ventilation; the improvement comprising, in combination, a valve device having

(a) a housing attached to said bladder;

(b) means defining an inlet chamber in said housing;

(c) means defining a valve inlet in said housing; said valve

inlet being connected to said bladder outlet for establishing communication between said bladder and said inlet chamber;

(d) means defining a valve outlet in said housing; said valve outlet being in continuous communication with said inlet chamber and being connected to the inlet of said three-way non-rebreathing valve;

(e) valve seat arranged on said housing and surrounding said valve inlet;

(f) a movable valve member supported in said housing adjacent said valve inlet for opening and closing said valve inlet; said movable valve member having

(1) a valve stem supported in said housing in the zone of said valve inlet for longitudinal displacement through said housing in a closing direction and in an opening direction;

(2) a soft, readily deformable resilient valve flap attached to one end of said valve stem and cooperating with said valve seat; said valve flap having an open position in which it is spaced from said valve seat for maintaining communication between said bladder and said inlet chamber; said valve flap having a contacting position in which it contacts said valve seat in an undeformed state; said valve flap having a closed position in which it engages said valve seat in a deformed state; in said closed position gas flow from said bladder to said inlet chamber is fully blocked; and

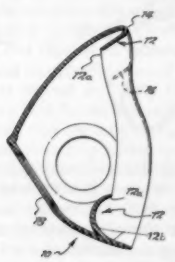
(g) control means responsive to pressure in said inlet chamber connected to said valve stem at a location spaced from said one end thereof for moving said valve stem in said closing direction and maintaining said valve flap in said closed position when the pressure in said inlet chamber exceeds predetermined values above the ambient pressure and for moving said valve stem in said opening direction and maintaining said valve flap in said open position when the pressure in said inlet chamber is below said predetermined values; the pressure in said inlet chamber needed for moving said valve stem into a position in which said valve flap assumes said closed position being only by a small increment larger than the pressure in said inlet chamber needed for moving said valve stem into a position in which said valve flap assumes said contacting position.

4,167,185

FACE MASK SEAL

Robert D. Lewis, Coloma, Mich., assignor to A-T-O Inc., Willoughby, Ohio

Filed Apr. 18, 1977, Ser. No. 788,237
Int. Cl.[2] A62B 7/00
U.S. Cl. 128—146.7 **8 Claims**



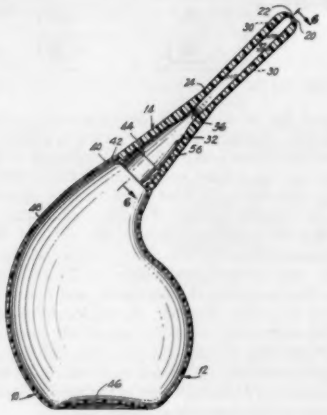
1. A face seal comprising, in combination with a mask body having an open side adapted to fit about a facial portion of a user, said body defining a facial portion receiving cavity defining an inner body surface and having a marginal edge portion around said open side thereof, sealing means adapted to form a seal between said body and the face of a user thereof, said sealing means comprising a resiliently flexible perimetrical sealing element in the form of a re-entrant flap joined to said body adjacent to said marginal edge portion and normally folded inwardly over said inner surface of said mask body and spaced therefrom whereby said face seal is conformable in sealing relation to a facial portion of a user independently of said body, and resilient strut-like web means extending between said sealing element and said inner surface of said body at selected locations spaced apart about the perimeter of said open side of said body and corresponding to the deepest areas of the facial portion of a user, said web means being operable to mechanically urge said sealing element against such deepest areas of the facial portion of a user.

4,167,186

SYRINGE, SUCH AS A VAGINAL DOUCHE, AND CANNULA THEREOF

Ernest W. Pick, Cos Cob; Joseph M. Denaro, Stamford, and Henry R. Goerke, Norwalk, all of Conn., assignors to The Purdue Frederick Company, New York, N.Y.

Filed Sep. 8, 1977, Ser. No. 831,595
Int. Cl.[2] A61M 1/00
U.S. Cl. 128—232 **5 Claims**



1. A syringe, such as a vaginal douche, comprising a cannula consisting of an elongated hollow tubular body having a central axis and having one open end and distant therefrom an opposed transverse end wall formed with an opening passing therethrough and through which said central axis extends, said cannula body having substantially midway between said open end and transverse end wall thereof a minimum transverse cross section in a plane perpendicular to said axis and said body tapering slightly from said transverse end wall toward said minimum cross section while tapering to a substantially greater extent from said open end toward said minimum cross section, the latter portion of said body between said open end and minimum cross section thereof forming part of a hollow cone, and said body being formed at its exterior between said minimum cross section and transverse wall with a plurality of grooves distributed uniformly about said axis with said body having ribs situated between said grooves and said body being formed inwardly of said ribs between said minimum cross section and transverse wall thereof with a plurality of openings through which a liquid in the hollow interior of said body can discharge with the liquid also being capable of discharging through said central opening of said end wall of said body, and a squeeze bottle removably connected with said cannula body at said open end thereof, said squeeze bottle having next to said cannula body an open end region which tapers in the same way as said body at the region of said open end thereof and forms an extension of said open end of said body, said squeeze bottle having distant from said open end region thereof a flat end wall

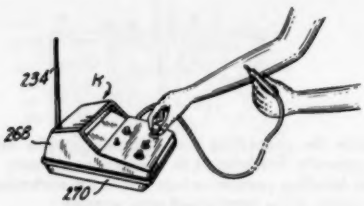
of substantially elliptical configuration having a major axis, said squeeze bottle having a plane of symmetry which contains said major axis as well as said central axis of said cannula body and said squeeze bottle also having in any plane parallel to said flat end wall of said squeeze bottle and normal to said plane of symmetry while being situated between said open end region of said bottle and said flat end wall thereof also an elliptical cross section having a major axis situated in said plane of symmetry, said squeeze bottle terminating in said plane of symmetry along one side in a convexly curved edge region extending from said open end region of said bottle to said flat end wall of said bottle and forming a continuation of said open end region of said bottle and on the opposite side terminating also in a convexly curved edge region which, however, at the open end region of said bottle merges into a concave edge portion which together with said convexly curved portion at said opposite side of said squeeze bottle provides the latter with a substantially S-shaped curvature.

4,167,187

DUAL EPILATION MACHINE

Alvaro D. Biagi, Huntington Station, N.Y., assignor to Kree Institute of Electrolysis, Inc., New York, N.Y.

Filed Mar. 17, 1977, Ser. No. 778,361
Int. Cl.[2] A61N *3/04*
U.S. Cl. 128—303.13 **22 Claims**



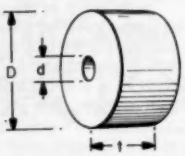
1. An epilator comprising:
(a) a DC power supply;
(b) a controlled timer;
(c) an RF power source coupled to said power supply and said timer and being energized from the power supply and switched by the timer, said RF power source having an output and a return;
(d) means for connecting an individual hair of a person to the output of said RF power source;
(e) an antenna connected to the return of said RF power source to provide a low impedance path for the radio frequency power from said person; and
(f) means for starting and for resetting the timer.

4,167,188

SURGICAL ELASTIC BAND

Coy L. Lay, deceased, late of Lakeland, Fla., and Madeline R. Lay, administratrix, P.O. Box 1429, Lakeland, Fla. 33802

Filed Dec. 13, 1976, Ser. No. 750,003
Int. Cl.[2] A61B *17/12*
U.S. Cl. 128—326 **6 Claims**



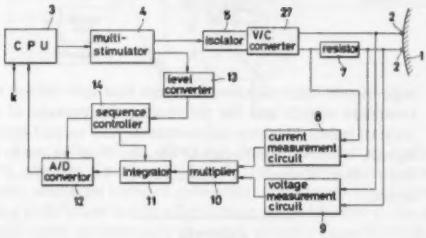
1. An elastic band adapted for tying off human fallopian tubes, said band consisting of a small, hollow tube whose inside diameter at its midsection is 1.8 to 2.2 mm and whose length is at least about 50% greater than the minimum inside diameter of said tube, the inside diameter of the tube being 0.2 to 0.6 mm. smaller at both ends that at the midsection of the tube.

4,167,189

APPARATUS FOR TRANSMISSION OF INFORMATION BY ELECTROCUTANEOUS STIMULUS

Susumu Tachi, Tokyo, and Kazuo Tanie, Yokohama, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 781,887
Claims priority, application Japan, Apr. 26, 1976, 51-48112
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—421 **3 Claims**



1. In an apparatus for the transmission of information, comprising means for applying pulse signals representing a desired item of information to electrodes fastened to the skin of a human subject for thereby transmitting the information by electro-cutaneous stimuli, an improvement which comprises
(a) the means for applying pulse signals including means for applying pulse signals corresponding to stimulation energy based on the information to be transmitted,
(b) means for measuring the current and voltage of the pulse signals corresponding to stimulation energy for thereby detecting the cutaneous impedance of the human subject,
(c) the means for applying pulse signals including means for applying pulse signals on the basis of the detected cutaneous impedance,
(d) means for controlling the pulse signals so that the product of the square of pulse height multiplied by pulse width of the pulse signals corresponding to stimulation energy is equal to the product of the square of the pulse height multiplied by pulse width of the pulse signals on the basis of the detected cutaneous impedance, and
(e) the means for applying the pulse signals including means for applying the controlled pulse signals to the electrodes.

4,167,190

PULSE DOSAGE CONTROL UNIT FOR TISSUE STIMULATION SYSTEM

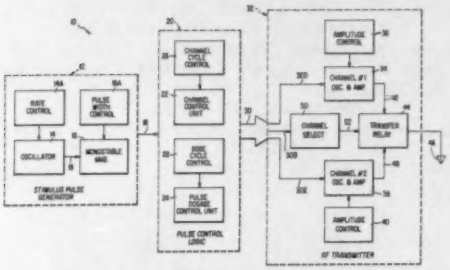
Paul D. Sorenson, Blaine, and Larry A. McNichols, Coon Rapids, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Oct. 21, 1977, Ser. No. 844,178
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—423 R **18 Claims**

1. Apparatus for controlling the energy content and the number of pulses of a dose of electrical stimulation to be applied to by lead means coupled to nerve tissues, said apparatus comprising:
(a) means for providing a continuous train of pulses at a selected frequency;
(b) duty cycle control means for producing first and second initiate signals and a terminate signal, said duty cycle means responsive to the occurrence of a predetermined number of pulses for providing said terminate signal oc-

curring a first interval after said first initiate signal of at least one pulse period, said second initiate signal occurring a second interval after said terminate signal of a selected whole number of said pulse periods; and

(c) gate means responsive to said first and second initiate signals and said terminate signal for facilitating the passage of said train of pulses between said first initiate and terminate signals and for preventing the passage of the train of pulses between said terminate and second initiate signals, whereby the dosage of the electrical pulses to the body tissue is constant regardless of the frequency selected.

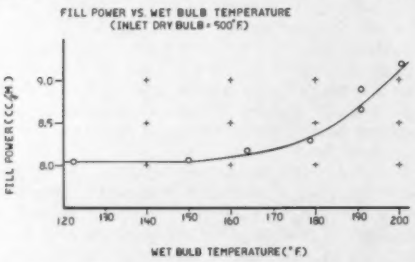


4,167,191

TOBACCO DRYING PROCESS

John N. Jewell; Ardath B. Canon, both of Louisville, and Richard P. Newton, Jr., Middletown, all of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Sep. 27, 1977, Ser. No. 837,331
Int. Cl.[2] A24B *3/18*
U.S. Cl. 131—140 R **21 Claims**



1. A method of reducing the moisture content of an expanded tobacco, which comprises:

heating the expanded tobacco in a gas, said gas having an initial temperature within the range of from about 250° F. to about 650° F., in the presence of an absolute humidity at a level above that which will provide a wet-bulb temperature reading of at least about 150° F.

4,167,192

CIRCULAR BRUSH

Franz Arnold, Triengen, Switzerland, assignor to Trisa Bürstenfabrik AG Triengen, Triengen, Switzerland

Filed Aug. 15, 1977, Ser. No. 824,922
Int. Cl.[2] A45D *20/00*
U.S. Cl. 132—9 **11 Claims**

1. A light-weight circular hairbrush for use with a separate hot air blower, comprising:

a bristle carrier composed of two mutually intertwined wire sections;

bristles fixedly clamped in a substantially helical-like arrangement between the intertwined wire sections;

a tubular element coaxially surrounding the intertwined wire sections;

said tubular element having a jacket surface provided at its circumference with openings therethrough;

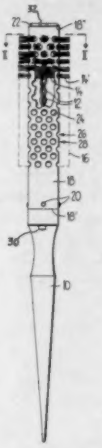
said bristles having free ends extending outwardly through said openings;

a handling portion fixedly attached to the tubular element for solely handling the circular hairbrush;

said handling portion being devoid of any air flow communication with the interior of said tubular element;

said tubular element being formed of metal;

said tubular element having opposed ends;



means for connecting said handling portion substantially coaxially with respect to said tubular element;

said handling portion include means for anchoring one end region of the intertwined wire sections;

an end piece means for closing the other opposed end of the tubular element;

said end piece means includes means for retaining the other end region of the intertwined wire sections; and

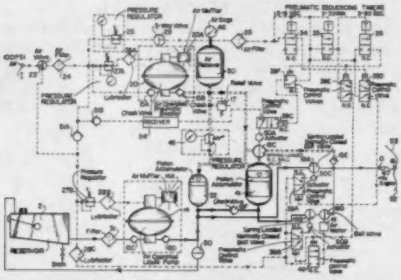
said tubular element has a portion coextending onto said handling portion.

4,167,193

APPARATUS FOR CLEANING JET ENGINE NOZZLES

Harve W. Magnus, 872 Manhattan Beach Blvd., Manhattan Beach, Calif. 90266, and Vincent J. Masur, 5127 NE. Marvin Rd., Kansas City, Mo. 64118

Filed Oct. 11, 1977, Ser. No. 841,008
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—95 **11 Claims**



1. Apparatus for cleaning residue fuel varnish and carbon from the fuel nozzles and guide vanes of a jet engine including: an inlet for receiving compressed air; an outlet configured to

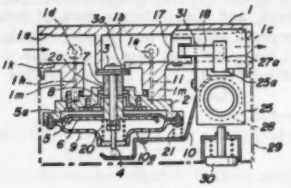
be coupled into the fuel system of a jet engine so that fluid emitted by the outlet may be discharged through the fuel nozzles of the jet engine to perform a cleaning function; air receiver means; first compressed air operated pump means coupled to the inlet for introducing compressed air into the air receiver means so as to achieve a predetermined air pressure in the air receiver means; a first liquid accumulator means coupled to the air receiver means; a reservoir for a cleaning solution; a second compressed air operated pump means coupled to the inlet and to the reservoir and to the first liquid accumulator means for introducing cleaning solution from the reservoir into the first liquid accumulator means against the pressure of compressed air from the air receiver means; first conduit means coupling the first liquid accumulator to the outlet; a first valve included in said first conduit means; and control means coupled to said first valve for controlling the flow of the cleaning solution through said first conduit means from the first liquid accumulator means to the outlet.

4,167,194

AUTOMATIC CUTOFF AND TESTER APPARATUS OF GAS SUPPLY

Tsuneki Matsuda, 1-8, Yuda 1-chome, Koufu-shi, Yamanashken, Japan

Filed Oct. 31, 1977, Ser. No. 846,842
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—38 **10 Claims**



1. Apparatus comprising:

a gas inlet for connection to a gas supply pipe;

a gas outlet for connection to a gas delivery pipe;

a first valve connected between the gas inlet and the gas outlet;

a chamber containing a diaphragm coupled to the first valve for controlling the position thereof and means biasing the diaphragm to a position in which the first valve is closed;

means defining a first passage including a normally closed second valve provided between the gas inlet side of the first valve and the chamber for supplying gas, said second valve, when open, for supplying gas to the chamber for overcoming the bias of the means biasing the diaphragm to cause the diaphragm to move to a position in which the first valve is open;

means defining a second passage including a third valve provided between the chamber and the gas outlet side of the first valve, the third valve having a normal position providing a normally open path between the chamber and the gas outlet side of the first valve and a normally closed path between the chamber and a point of ambient pressure;

sensing means including a magnet and a movable weight which is attractable to the magnet;

means for preventing the weight from being attracted to the magnet when the first valve is closed; and

resetting means, operable to open the second valve, for insuring said third valve is in its normal position, and for moving the weight into attraction by the magnet when the control valve is open;

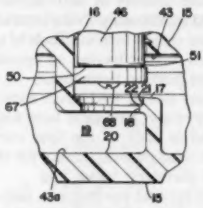
the sensing means being responsive to an externally supplied force to cause the weight to fall from the magnet and consequently to control the third valve to move from its normal position to close said normally open path and to open said normally closed path, thereby to allow the means biasing the diaphragm to move the diaphragm to the position in which the first valve is closed.

4,167,195

VALVE

Don R. Miller, Ashland, Ohio, assignor to U-Brand Corporation, Ashland, Ohio

Filed Sep. 22, 1977, Ser. No. 835,637
Int. Cl.[2] F16K *1/48*
U.S. Cl. 137—269 **4 Claims**



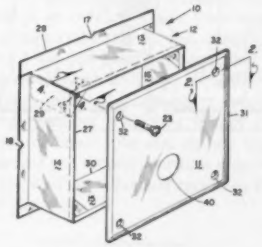
1. In a valve of the character described, a valve body, a valve stem mounted in said body for reciprocal movement therein, said stem being of cylindrical configuration and terminating at its lower end in a flat surface perpendicular to the axis of said stem, an internally threaded metallic element frictionally secured within the lower central portion of said stem, a washer of non-metallic material disposed in contact with said flat surface, and a screw for securing said washer to said flat surface, said screw being threadedly secured to said element.

4,167,196

VANDAL-PROOF PLUMBING VALVE ACCESS BOX

Earl L. Morris, Whittier, Calif., assignor to Acorn Engineering Co., Industry, Calif.

Continuation-in-part of Ser. No. 749,882, Dec. 13, 1976, abandoned. This application Oct. 21, 1977, Ser. No. 844,360
Int. Cl.[2] F16K *27/10*; H02G *3/08*
U.S. Cl. 137—360 **7 Claims**



1. A vandal - proof plumbing valve access box for placement in an aperture in a mounting wall having a front face and a rear face for housing a plumbing valve and for preventing access thereinto by unauthorized persons or vandals while permitting actuation of a pushbutton of the plumbing valve; comprising:

(a) a sleeve defined by a wall thereabout, said wall of said sleeve being co-extensively disposed between the pair of oppositely - disposed faces of said mounting wall and defining a single, rectangularly - shaped passageway therethrough, said sleeve having front and rear portions with rims thereabout and having a first flange disposed about the rim of said rear portion of said sleeve, said first flange being directed outwardly in a radial fashion therefrom, whereby said sleeve is stiffened and strengthened

and may be positioned in said aperture in said mounting wall and when said first flange is abuttingly positioned thereabout it prevents said sleeve from being moved further through said aperture in said mounting wall so that said front portion of said sleeve does not project beyond the front face of said mounting wall;

(b) four brackets, each of said brackets being formed from a piece of rectangularly-shaped sheet metal wherein a pair of the complementary corners are bent along a diagonal line passing through the adjacent non-complementary corner, said corners following said bending are each disposed in a plane, said planes being disposed at right angles to one another and wherein said brackets are arranged to bridge the inside corners of said sleeve and respectively secured in fixed relationship to the intersection of adjacent sidewalls of said sleeve forming each of said corners, each of said brackets further having an aperture therethrough with a threaded portion thereabout;

(c) a cover for said sleeve, said cover extending beyond the rim of said sleeve and having at least four apertures adjacently disposed to each of the four corners thereof and having an apertured portion therein for the pushbutton for operating said plumbing valve; and

(d) security bolts for said apertures in said cover, said bolts being mateably receivable in threadable fashion with said threaded apertures in said brackets.

4,167,197

DIRECTIONAL CHANGE-OVER VALVE

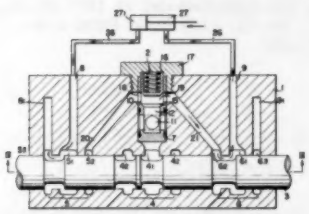
Toshio Maki, Yokohama; Isao Oki, Kawasaki, and Kiyoshi Shirai, Tokyo, all of Japan

Continuation of Ser. No. 190,586, Oct. 19, 1971, abandoned. This application Jan. 10, 1977, Ser. No. 757,861

Claims priority, application Japan, Oct. 20, 1970, 45-91593

Int. Cl.[2] F15B *13/08*; F16K *11/10*

U.S. Cl. 137—271 **11 Claims**



1. A valve device capable of operating in a parallel, series or tandem hydraulic circuit, said device comprising a valve body having opposite flat connecting surfaces at both sides thereof; a bore through said valve body; and interchangeable spool means, having cutouts on the surface thereof, said spool being longitudinally slidably positioned in said bore; a hole in said valve body; said valve body having at least three valve chamber groups contiguous with said bore including a center group and two side groups, each group comprising a main valve chamber and a sub valve chamber on each side of said main valve chamber; said main valve chamber of said center group of said valve chamber groups communicating directly with said hole, said hole being peripendicular to the axis of said spool means and parallel with said connecting surfaces of said valve body; a first port within said valve body on the connecting surface of said valve body connected to said central valve chamber group and a bypass passage passing through said valve body between the connecting surfaces of said valve body, said main valve chamber of said center group communicating with said first port and said hole of said valve body communicating with said bypass passage; said valve body having at least two inclined passages having one end at the respective sub valve chambers of said side valve chamber groups which are towards the center valve chamber group and the other end connected to said hole at a position not crossed by said bypass passage of said valve body; two supply passages in said body each said supply passage being perpendicular to the axis of said spool and parallel to said connecting surfaces of said valve body wherein each main valve chamber of said side valve chamber groups communicate with one of said supply passages; drain passages in said valve body, the sub valve chambers of the side valve chambers communicating with said drain passages passing through said connecting surfaces of said valve body; said valve body further including a second port, said sub valve chambers of the center valve chamber group communicating with said second port at said connecting surface opposite to that of said first port; and an interchangeable element means slidably inserted into said hole in said valve body, said element means including passages therethrough communicating with at least one of said bore, bypass passage, and inclined passages.

4,167,198

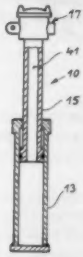
OVERPRESSURE VALVE FOR A HYDRAULIC PIT PROP

Heinrich Kotyza, and Harri Heinze, both of Salzgitter, Fed. Rep. of Germany, assignors to Salzgitter Maschinen Aktiengesellschaft, Salzgitter, Fed. Rep. of Germany

Filed Feb. 17, 1977, Ser. No. 769,368

Int. Cl.[2] F16K *17/02*

U.S. Cl. 137—528 **22 Claims**



1. An overpressure valve for a hydraulic pit prop, comprising a housing; a valve seat formed in said housing; a valve body movable in said housing between a closed position engaging said valve seat and an open position; means cooperating with said valve body for biasing the latter to said closed position and comprising bellows means including a bellows having opposite ends and being filled with a gas under pressure, one of said opposite ends being gas-tightly connected to said valve body and a terminal member gas-tightly connected to the other end of said bellows; and a screw plug screwed into said housing and abutting against said terminal member.

4,167,199

TIMING DEVICE FOR PNEUMATIC SIGNALS

Karl Hodler, Bülttikon, Switzerland, assignor to H. Kuhnke Elektrotechnik GmbH, Switzerland

Filed Jan. 25, 1978, Ser. No. 872,158

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1977, 2703893

Int. Cl.[2] G05D *16/00*

U.S. Cl. 137—624.11 **7 Claims**

1. A timing device for pneumatic signals, capable of produc-

ing an output in response to an input signal, with a selectable delay between signals, said device comprising:

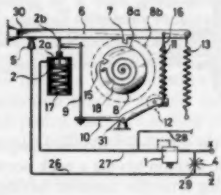
(a) a moveable control member having a track and a recess in the track;

(b) a control lever, pivotable between initial, intermediate and terminal positions and having a pawl attached thereto;

(c) a pneumatic motor;

(d) gear means engageable between the motor and control member for driving the control member;

(e) a linkage between the control lever and gear means;



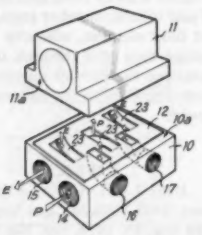
(f) an adjustable support for holding the control lever in its initial position and the gear means in a non-engaged relation, the support being responsive to an input signal to engage the gear means and cause the control lever to assume its intermediate position wherein the pawl means engages the track of the control member, with control member motion eventuating in alignment of the pawl and recess whereupon the control lever drops into its terminal position where it disengages the gear means and causes creation of an output signal.

4,167,200

DISTRIBUTION DEVICE FOR A PNEUMATIC INSTALLATION

Daniel Bouteille, Marnes-la-Coquette, France, assignor to La Telemechanique Electrique, France

Filed Apr. 1, 1977, Ser. No. 783,634
Claims priority, application France, Apr. 2, 1976, 76 0968
Int. Cl.[2] F15B *13/04*
U.S. Cl. 137—884 **12 Claims**



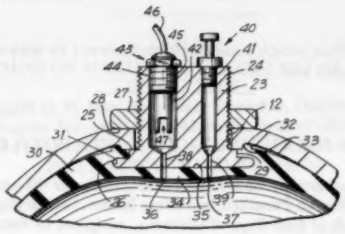
1. An improved distribution device for a pneumatic installation comprising: a distributor, an inlet and outlet base for distributed fluid, cooperating with said distributor by maintaining contact therewith by corresponding substantially flat connection surfaces on the distributor and on the base, a seal between said corresponding flat connection surfaces, the flat connection surface on the base being provided with orifices connected to conduits inside the base which are connected to a pressurized fluid supply orifice, to at least one exhaust orifice, and to at least one outlet orifice adapted to be connected to a receiver, the flat connection surface on the distributor being provided with orifices and interconnected by conduits inside the distributor, the device thus presenting by means of said conduits internal channels through which pneumatic fluid normally passes in one direction and internal channels through which it normally flows in two directions, wherein at least one of the internal channels through which the pneumatic fluid normally passes in one direction, is equipped, substantially at the surface common to the base and to the distributor, with a non-return valve allowing the free passage of the fluid in the normal direction of its circulation.

4,167,201

PRESSURE ACCUMULATOR WITH FAILURE INDICATOR

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Chatsworth, Calif.

Filed Apr. 3, 1978, Ser. No. 892,958
Int. Cl.[2] F16L *55/02*
U.S. Cl. 138—30 **1 Claim**



1. An accumulator device comprising, in combination, a pressure resistant shell having an oil port at one end and a gas charging port at the other end, a resilient, distensible bladder member supported in said shell including a mouth surrounding said gas charging port, said bladder dividing the interior of said shell into first and second chambers, respectively communicating with said oil and said gas ports, a plug member mounted in said gas charging port, said plug member including a laterally directed flange portion, said mouth of said bladder surrounding said flange portion and being clampingly urged by said flange against inner surface portions of said shell surrounding said gas charging port, said plug member having a bore portion substantially axially aligned with the major axis of said shell, the diameter of said bore portion being substantially greater at its outer end than at its inner end, said inner end defining a restricted flow passage into said second chamber, said plug member including a gas charging valve mounted in said plug member and communicating with said second chamber, and liquid sensing means mounted in the outer end of said bore portion and communicating with said second chamber for sensing the ingress of liquid into said second chamber, said bladder including first and second apertures respectively communicating through said gas valve and restricted flow passage with said second chamber.

4,167,202

WIRE TWISTING APPARATUS

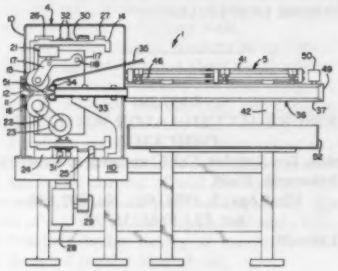
Thomas L. Price, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Jul. 25, 1977, Ser. No. 818,744
Int. Cl.[2] B21F *7/00*
U.S. Cl. 140—115 **20 Claims**

1. Wire twisting apparatus comprising:

a twist head, die means positioned on one side of said twist head for guiding a plurality of wires into said twist head, and guide means on an opposite side of said twist head for directing multi-strand cables formed by said twist head to a receiving means, wherein said twisted head includes roll means rotatable about axes both parallel and transverse with respect to said wires, and means for rotating said roll

means about said axes to both twist said wires and advance them through said twist head, wherein said die means has



a surface which conically tapers toward an inlet slot so as to guide said wires thereto.

4,167,203

DEVICE FOR FILLING LIQUIDS INTO BOTTLES AND SIMILAR VESSELS

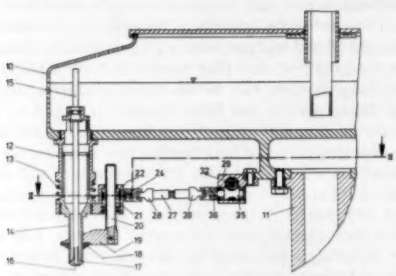
Erwin Tschersich, Bad Kreuznach; Waldemar Mergenthaler, Kalkofen; Ali Pamukcu, and Klaus Kaiser, both of Bad Kreuznach, all of Fed. Rep. of Germany, assignors to Seitz-Werke GmbH, Bad Kreuznach, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,578

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1976, 2634021

Int. Cl.[2] B65B *31/00*; B67C *3/34*

U.S. Cl. 141—59 **12 Claims**



1. A device for filling liquids into vessels, especially bottles, which includes: a container adapted to receive the liquid to be filled into vessels, a plurality of filling elements connected to said container, a plurality of filling pipes respectively axially shiftable and displaceably arranged in said filling elements, a plurality of stationary gas tubes arranged in said filling pipes and extending into said container and having a first opening at that end which extends into said container and also having a second opening at the other end thereof, that gas tube end which contains said second opening forming a valve with the respective adjacent end of the pertaining filling pipe, sealing means respectively axially shiftable and displaceable in common with said filling pipes for engagement with the mouth of the vessels to be filled with liquid for assured opening of liquid discharge, individual adjusting means operatively connected to each said sealing means for both upwardly and downwardly adjusting the latter as to height, and common actuating means operatively connected to said individual adjusting means for actuating the latter to assure that both from a central location said sealing means are adjustable upwardly and downwardly for setting of filling level and also liquid discharge of each filling element can be opened and closed with certainty by way of a particular bottle to be filled.

4,167,204

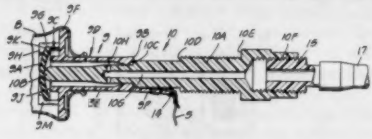
APPARATUS FOR INFLATING TOY BALLOONS

Avraham Zeyra, Los Angeles, Calif., assignor to Creative Balloons, Inc., Carmel Valley Village, Calif.

Continuation of Ser. No. 679,475, Apr. 22, 1976, abandoned, which is a division of Ser. No. 563,500, Mar. 31, 1975, Pat. No. 3,994,324. This application Jul. 22, 1977, Ser. No. 818,012

Int. Cl.[2] F16K *15/20*

U.S. Cl. 141—348 **2 Claims**



1. Apparatus for inflating balloons comprising, in combination: an inflatable balloon having a neck portion, a check valve assembly including a tubular member having an annular valve seat at one end, a radially extending integral flange on said tubular member adjacent said valve seat, a portion of the balloon neck encompassing said tubular member and said flange to prevent separation of said balloon neck and said tubular member, a circular imperforate resilient disk within the neck of the balloon engageable with said annular seat to prevent escape of gas from the interior of the balloon through the interior of said tubular member, apertured means carried on said flange for supporting said disk in position said opertured means having at least one operture therethrough through which gas may flow into said balloon when said disk is moved from its seat, a stationary filler element having a rounded imperforate nose portion, said nose portion being received within the interior of said tubular portion upon relative telescopic movement of said tubular member with respect to said filler element, said tubular member having an end shoulder remote from said annular seat engaging an external stop shoulder formed on said filter element, said filter element having a longitudinal passage therein extending beyond said stop shoulder but terminating short of said rounded nose portion, said filter element having a lateral port located between said rounded nose portion and said external stop shoulder, said rounded nose portion contacting said resilient disk to move it away from said annular seat when the end shoulder of said tubular member engages the external stop shoulder on said filler element, whereby gas supplied to said longitudinal passage may pass through the port and into an annular space between the tubular member and the filler element and then into the neck of the balloon through said apertured support means.

4,167,205

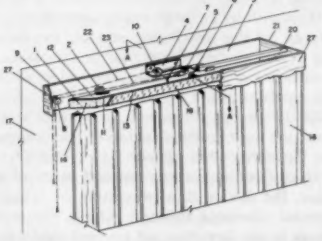
INSULATING VALANCE

Dale B. Gerdeman, 1403 Fifth St., Las Vegas, N. Mex. 87701

Filed Sep. 15, 1978, Ser. No. 942,781

Int. Cl.[2] A47H *1/00*

U.S. Cl. 160—330 **2 Claims**



1. A device for forming a closed chamber with transverse

rod hung drapes, and the wall of a room, to control the circulation of room air past windows, comprising:

a baffle having a baffle plate generally rectangular in shape with an upper surface and lower surface; batting and batting cover attached to and covering the lower surface of the baffle plate, and a latch ring and lift eye attached to the upper surface of the baffle plate at approximately mid-length of the baffle plate, the latch ring mounted thereon to mate with a latch; the baffle being mounted by a plurality of hinges to

a frame consisting of a back longitudinal rail, two end braces, a support bar forming a rectangular frame having a mechanism bracket mounted to and between the back longitudinal rail and support bar at approximately the mid-length of the back longitudinal rail and support bar; and the mechanism bracket having mounted thereon a latch and a lift pulley, and latch mating with the latch ring,

a latch pulley and a baffle pulley mounted on one of the end braces;

a latch cord, which attaches to the latch, is threaded over the latch pulley and hangs down free, a convenient length,

a baffle cord which attaches to the lift eye, is threaded over the lift pulley, thence over the baffle pulley and hangs down free a convenient length,

a sealing strip of thin plastic such as polyethelyne, affixed as by glueing to the back longitudinal rail, over the hinge, and to the upper surface of the baffle plate;

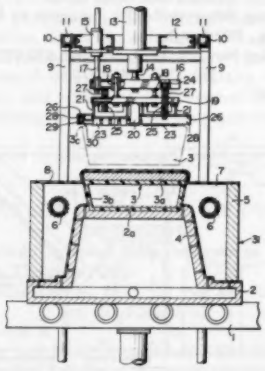
whereby an operator of the invention pulls on the latch cord to release the latch, and pulls or releases the baffle cord to raise and lower the baffle, and whereby the baffle in its raised position frees the drapes for opening and closing; and whereby the baffle in its lowered position engages the top of the drapes, forming a closed chamber with the wall and drapes.

4,167,206

METHOD FOR FORMING VACUUM-SEALED MOULD

Hideto Terada, and Masanori Yosikawa, both of Toyokawa, Japan, assignors to Sintokogio Ltd., Nagoya, Japan

Filed May 17, 1978, Ser. No. 906,878
Claims priority, application Japan, May 20, 1977, 52-59110
Int. Cl.[2] B22C *9/02*
U.S. Cl. 164—7 **10 Claims**



1. A method for forming a communication-hole in a vacuum sealed mould, comprising the steps of:

(i) disposing a communication hole-forming pattern on a mould cavity forming pattern,

(ii) applying a first shield member over the surfaces of said cavity forming pattern and said communication-hole-forming pattern under a vacuum pressure from the inside of said cavity forming pattern;

(iii) assembling said patterns with a moulding flask;

(iv) charging a particulate material into said moulding flask;

(v) applying a second shield member over the surfaces of said moulding flask, the charged particulate material and the top portion of said communication-hole-forming pattern;

(vi) forcing said first and second shield members into intimate contact with the said charge material by applying a vacuum pressure in said moulding flask;

(vii) welding said first and second shield members together along the periphery of said top surface of said communication-hole-forming pattern;

(viii) cutting said first and second shield members along the periphery of said top surface of said communication-hole-forming pattern, and

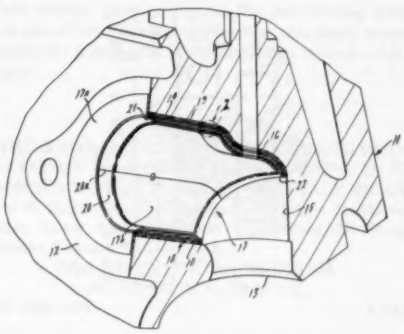
(ix) removing said communication hole forming pattern from said pattern.

4,167,207

METHOD OF MAKING LOW COST CAST-IN-PLACE PORT LINER

Vemulapalli D. N. Rao, Bloomfield Township, Oakland County, and Angelo Jaimee, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 9, 1977, Ser. No. 849,729
Int. Cl.[2] B22D *19/08*
U.S. Cl. 164—9 **3 Claims**



1. A method of fabricating a cast-in-place heat insulating liner for an internal combustion engine, comprising:

(a) forming male and female deep-drawing dies adapted to stretch and define a cup-shaped member having an exterior conforming to a desired exhaust port configuration, and forming male and female stamping dies to define a cylinder effective to nest within said cup-shaped member,

(b) while employing said deep-drawing dies, drawing a blank of mild carbon steel into said cup-shaped member constituting the outer supporting skin of a multi-zone heat insulating liner, and piercing said member at the closed end to define an opening,

(c) while employing said dies, stamping a predetermined blank of aluminum-chromium steel, and then roll forming said blank of aluminum-chromium steel into a cylindrical inner skin configuration having a longitudinal seam; said configuration conforming to the inner surface of said outer supporting skin less about 0.08 inches and except at the leading and trailing margins thereof where said skins are brought together,

(d) welding said cylindrical configuration along said longitudinal seam to form a closed cylinder,

(e) mounting a sleeve of insulation on said inner skin, the radially outer layers of said sleeve consisting of an adhesive with a melting temperature in excess of 250° F.,

(f) spot welding said inner and outer skins at said leading and trailing margins to define a closed or trapped air space

therebetween with said insulation enveloped, thereby completing a liner assembly,

(g) filling the interior of said liner assembly with sand to form a core to define an exhaust passage, and

(h) while employing said liner assembly, as a sheathed sand core, casting molten cast iron therabout to form an engine housing with said liner assembly cast-in-place.

4,167,208

METHOD AND APPARATUS FOR THE PRODUCTION OF FOUNDRY MOLDS

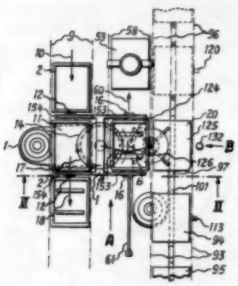
Erwin Bührer, Vögelingisschen 40, 8200 Schaffhausen, Switzerland

Filed Jun. 12, 1978, Ser. No. 914,969

Claims priority, application Switzerland, Jun. 15, 1977, 7338/77

Int. Cl.[2] B22C *15/02, 25/00*

U.S. Cl. 164—18 **20 Claims**



11. Apparatus for the production of foundry molds comprising filling means arranged at a filling station for filling with mold forming material mold boxes positioned at said filling station, first shifting means for shifting pattern devices between a first shifting station and said filling station, second shifting means for shifting mold boxes between a second shifting station and said filling station, a mold forming unit, first conveyor means for transporting pattern devices to and from said first shifting station, second conveyor means for transporting empty mold boxes to said second shifting station and for transporting molds from said second shifting station, and third conveyor means for transporting mold forming assemblies including a mold box and a pattern device filled with mold forming material from said filling station to said mold forming unit and returning molds and pattern devices back to said filling station, said first shifting device operating to shift a first pattern device from said first shifting station into position for assembly with an empty mold box at said filling station while simultaneously shifting another pattern device disassembled from a mold from said filling station back to said first shifting station, said second shifting means operating to shift an empty mold box from said second shifting station to said filling station to enable assembly with a pattern device at said filling station and filling by said filling means for subsequent transfer to and from said mold forming unit, said second shifting means simultaneously shifting a mold separated from a pattern device back to said second shifting station for transport away therefrom by said second conveyor means.

4,167,209

BOILERS

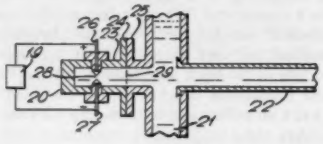
David P. Simpson, Chester, England, assignor to The Electricity Council, United Kingdom

Division of Ser. No. 685,480, May 11, 1976, Pat. No. 4,077,465. This application Nov. 9, 1977, Ser. No. 849,922

Claims priority, application United Kingdom, Aug. 15, 1975, 32041/75

Int. Cl.[2] F28G *7/00*

U.S. Cl. 165—1 **8 Claims**



1. A method of disrupting vapour films formed in film boiling in boilers having a fire space and a liquid space, the method comprising the step of effecting transient electrical discharges in a body of liquid in acoustic communication with the boiler liquid but separate from it and not constituting part of it, the discharges being effected at at least one selected location in the boiler such that shock waves produced by the discharges act on surfaces of the boiler liquid space where vapour films are to be disrupted.

5. A boiler comprising means defining a fire space; an acoustically transmissive membrane; means including said acoustically transmissive membrane defining a first liquid space in heat transfer relation with the fire space and a second liquid space in acoustic communication with the first liquid space but separated therefrom; and means within said second liquid space for effecting transient electrical discharges in a body of liquid therein at at least one location selected such that, in use, shock waves produced by the discharges are communicated to liquid in said first liquid space to act on surfaces of the first liquid space to disrupt vapour films formed in film boiling.

4,167,210

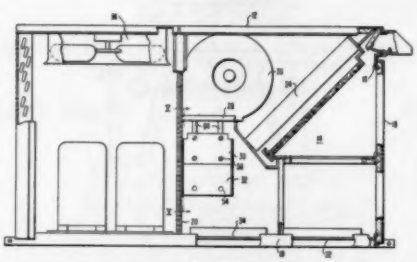
ELECTRIC HEAT MODULE MOUNTING ARRANGEMENT FOR ROOF TOP TYPE AIR CONDITIONING UNIT

Robert R. Young, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 23, 1977, Ser. No. 853,987

Int. Cl.[2] F24H *3/00*

U.S. Cl. 165—47 **4 Claims**



1. In a roof top type air conditioning unit having an indoor air flow section in which the refrigerant coil thereof is mounted upstream of at least a pair of indoor air blowers having downwardly directed discharge openings, a supplemental electric heat arrangement comprising:

at least one electric heat module for each blower, each module including opposite end walls forming a part of an upwardly and downwardly open-face frame containing

electric resistance heaters therewithin, the open-face area of each said frame being generally coextensive with the area of a discharge opening of a blower;

means mounting at least one module below each discharge opening of a blower and in general alignment therewith with the upper open face of the module being spaced downwardly from the respective discharge opening of the blower to permit the bypass of at least some of the discharge air from the blower around the frame to reduce the resistance to air flow imposed by said module.

4,167,211

INTERLOCKING SPACER MEMBERS FOR COILED TUBE ASSEMBLY

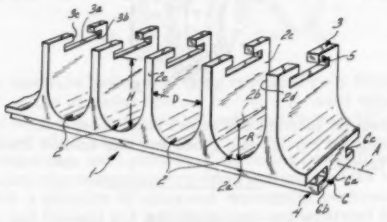
Dieter Haller, Garching, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Mar. 25, 1977, Ser. No. 781,487

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613745

Int. Cl.[2] **F28D** *7/00;* **F28F** *9/00*

U.S. Cl. 165—78 **4 Claims**



1. A heat exchanger comprising a coil assembly having a plurality of coaxial layers of helically coiled tubes, a respective spacer body for each of said layers, said bodies being all identical and constituting the sole means for holding said coils in spaced apart relation said bodies each being elongated and formed with a multiplicity of recesses receiving respective turns of the respective layer and mating formations on opposite sides of each body enabling the weld-free interconnection of said bodies to space said layers apart by relative longitudinal displacement of two adjacent bodies, each of said bodies being formed along an underside with a continuous T-section rail constituting one of said formations, each body being provided between each two of the respective recesses with a wall lying in a plane perpendicular to the rail and having a free end remote therefrom, all of said free ends being formed with T-shaped windows which are aligned with one another parallel to the respective rail for accommodating the rail of an adjacent body, said bodies being connected to one another solely by the fitting of a rail of one body into the windows of another.

4,167,212

DEVICE FOR PREHEATING AIR USED IN COMBUSTION

Arvind C. Thekdi, Sylvania, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jun. 30, 1977, Ser. No. 811,603

Int. Cl.[2] **F28F** *3/02*

U.S. Cl. 165—134 R **12 Claims**

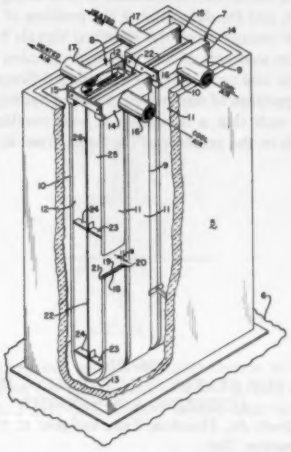
1. A device which is disposable in a flue for recapturing some of the heat of exhaust gases exiting the flue, comprising:

(a) a pair of elongated tubes each of which are composed of heat conductive material;

(b) means for mounting the pair of tubes longitudinally within the flue in parallel relation so that the exhaust gases flow between the pair of tubes in one direction as they exit the flue;

(c) means for circulating fluid, under pressure, through the tubes; and

(d) an elongated shield disposed between the pair of tubes and extending longitudinally thereof, the shield having at least one heat radiating surface facing each of the tubes in parallel spaced relationship therewith and designed to radiate against the tubes, heat received by convection



from exhaust gases exiting the flue and flowing between the pair of tubes in said one direction, said shield including means for holding the shield in parallel relation with said tubes.

4,167,213

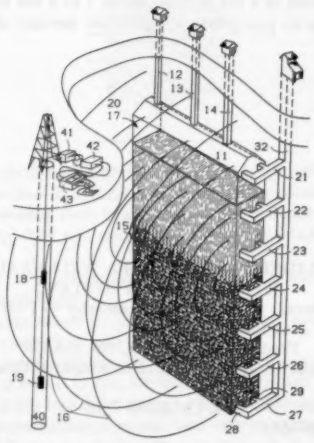
METHOD FOR DETERMINING THE POSITION AND INCLINATION OF A FLAME FRONT DURING IN SITU COMBUSTION OF A RUBBLED OIL SHALE RETORT

Richard A. Stoltz, Murrysville, Pa., and Albert C. Metrailer, Broken Arrow, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jul. 17, 1978, Ser. No. 925,064

Int. Cl.[2] **E21B** *43/24, 47/12*

U.S. Cl. 166—251 **6 Claims**



1. A method for determining the position of the flame front within a rubbled oil shale retort of known dimensions and known position during an in situ combustion of said oil shale retort comprising: (a) detecting at a plurality of known positions relative to said oil shale retort the acoustic energy gener-

ated by said flame front by moving a pair of matched hydrophones separated by a fixed known distance through a well bore which is liquid-filled and which has been drilled such as to traverse, at a known distance thereto, a sidewall of said retort of which the flame front is intended to pass along during in situ combustion, and (b) determining the position of the source of the acoustic energy from the received signals by leading the outputs from said pair of matched hydrophones to a differential amplifier and recording the resulting difference as a function of the position of said pair of matched hydrophones in said well bore such that a minimum in said resulting difference corresponds to the position of the flame front in said oil shale retort.

4,167,214

PROCESS FOR STABLY SEQUESTERING IRON WHILE ACIDIZING A RESERVOIR

Evan H. Street, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jul. 13, 1978, Ser. No. 924,269
Int. Cl.[2] E21B *43/27*
U.S. Cl. 166—307 **11 Claims**

1. In a well treating process in which an aqueous acid is injected into a subterranean reservoir, the acid as injected has a pH of less than about 2 and contains or dissolves ferric ion-containing materials and, as the acid reacts within the reservoir and reaches a pH of more than about 3, it precipitates ferric ion-containing materials, an improvement, for avoiding such a pH-induced precipitation of solids, which comprises:

dissolving within the acid solution being injected an amount of 5-sulfosalicylic acid which is sufficient to sequester significant proportions of ferric ions at a pH of from about 0.5 to 3 but is less than enough to cause a significant salting-out of solid materials, and an amount of citric acid which is sufficient to sequester significant proportions of ferric ions at a pH of from about 3 to 6 but is less than enough to precipitate a significant amount of calcium citrate.

4,167,215

GUIDELINELESS SUBSEA WELLHEAD ENTRY/REENTRY SYSTEM

Paul M. Thorne, Escondito, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Dec. 2, 1977, Ser. No. 856,879
Claims priority, application United Kingdom, Feb. 26, 1977, 8215/77
Int. Cl.[2] E21B *7/12*
U.S. Cl. 166—341 **22 Claims**

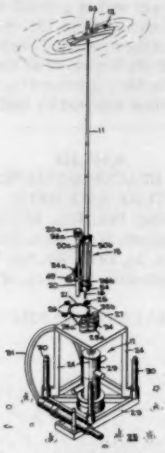
1. A guidelineless subsea wellhead entry system for use with an elongated column and a subsea well having a subsea installation attached thereto, said system comprising:

an elongated probe;

means for connecting said probe to said column;

an offset funnel having a wide mouth portion and a smaller neck portion, the axis of said neck portion being parallel to and spaced from the axis of said mouth portion of said funnel;

means for mounting said funnel to said subsea installation;



means for locating said subsea installation; and

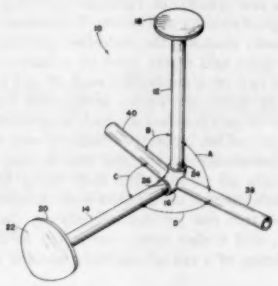
means for moving said probe and said column toward said funnel.

4,167,216

MULTIPLE STAND TO AID SHOEING HORSES

Bud A. Beaston, Rte. 1, Box 13, Sperry, Okla. 74073

Filed Dec. 29, 1977, Ser. No. 865,538
Int. Cl.[2] A01L *7/00, 11/00*
U.S. Cl. 168—44 **8 Claims**



1. A farrier's multiple work stand comprising;

a first elongated tool support member having a first enlarged special purpose work plate at the outer end thereof;

a second elongated tool support member disposed perpendicular to the first member and having a second enlarged special purpose work plate at the outer end thereof;

base means secured between adjacent inner ends of the first and second support members, said base means comprising a pair of outwardly extending oppositely disposed leg members, the longitudinal axis of each leg member being noncoplaner with respect to the plane of the first and second tool support members;

whereby in one position of the work stand, the lowermost extending portions of each leg member and the lowermost extending portion of the first work plate define a plane substantially parallel to the longitudinal axis of the first support member; and in a second position of the work stand the lowermost extending portion of each leg member and the lowermost extending portion of the second

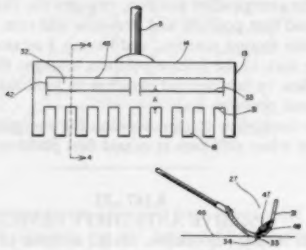
work plate define a plane substantially parallel to the longitudinal axis of the second support member.

4,167,217

HAND RAKE WITH CUTTING EDGE

Phillip Tarantino, 6767 Northland Rd., Manteca, Calif. 95336

Filed Jan. 10, 1978, Ser. No. 868,391
Int. Cl.[2] A01B *1/20*
U.S. Cl. 172—375 **2 Claims**



1. In a hand rake having an arcuate rake head body forming a cavity on the underside thereof having a forward edge, a rearward edge, and a transverse axis substantially parallel with said forward edge, a handle normally and centrally affixed to said rearward edge and a plurality of distending teeth affixed to said forward edge comprising providing said arcuate rake head body with a plurality of elongated rectangular perforations between said forward and rearward edges and separated from said forward edge by a sufficient amount to provide an unperforated area for the collection of dirt particles, the long axis of said rectangular perforations being substantially parallel to said transverse axis of said rake head body thereby forming a rearward long side and a forward long side sunbstantially parallel to said transverse axis, said arcuate body continuing in an arcuate manner from said forward long side for a substantial portion of the distance to said forward edge, said distending teeth being in such an angular relation to the handle that when the handle is in its ordinary raking position the teeth will form an obtuse angle with the ground under the cavity, said forward long side of said rectangular perforation forming a lip which extends outwardly from and substantially tangential to the outside surface of said arcuate body for a sufficient distance to create a cutting edge when the rake is used in the inverted position.

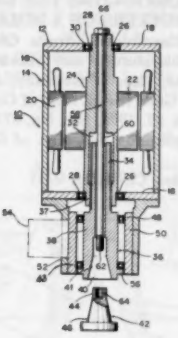
4,167,218

MACHINE TOOL ARRANGEMENT

Tatsuya Horiuchi, Yokohama; Michio Nawa, Tokyo; Akira Tsujimura, Yokohama; Mitsuru Kubota, Higashimine; Tomoaki Osada, Chiba; Seiji Manabe, Sunto, and Hiromu Iwasawa, Yokohama, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Feb. 28, 1977, Ser. No. 773,122
Int. Cl.[2] E21B *3/00*
U.S. Cl. 173—163 **8 Claims**

1. A machine tool arrangement comprising a main motor including a hollow casing, a stator secured coaxially within said casing, and a rotor extending coaxially within said stator, said motor having a hollow cylindrical rotor shaft integral therewith and extending coaxially therethrough, a hollow driving spindle disposed coaxially within said rotor shaft, said spindle being inserted in said rotor shaft at one end thereof for relative axial movement and rotation, said spindle being driven in rotation by said motor, said spindle having an opposite end provided with an arbor-receiving opening, a drawrod extending through said rotor shaft and said spindle and having an externally threaded end, an arbor having an internally threaded opening engageable with said externally threaded end for securely attaching said arbor to said spindle, and adjusting means for adjusting the position of said arbor relative to a workpiece, said adjusting means including a hollow cylindrical quill housing secured at one end to said main motor casing, a hollow cylindrical quill received coaxially in said quill housing and supporting said spindle rotatably therein so as to slide axially relative to the spindle and the casing, and means for axially displacing said quill relative to said quill housing and said spindle.

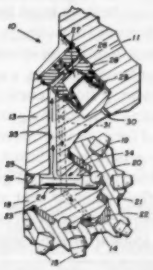


4,167,219

VISCOUS PUMP ROCK BIT LUBRICATION SYSTEM

Robert W. McQueen, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 24, 1978, Ser. No. 936,554
Int. Cl.[2] E21B *9/08*
U.S. Cl. 175—229 **3 Claims**



1. In an earth boring bit including a bit body with a bearing shaft connected to said bit body, a rotatable cutter mounted upon said bearing shaft, bearing means and seal means between said bearing shaft and said cutter, the improvement comprising:

a lubricant circulation system including a lubricant reservoir in said bit body;

first passage means for channeling lubricant from said lubricant reservoir to said bearing means;

second passage means for channeling lubricant from said bearing means to said lubricant reservoir; and

viscous pump means for pumping lubricant through said first and second passage means, said viscous pump means including

an annular bearing element positioned between said bearing shaft and said rotatable cutter, said annular bearing element having

an inner surface that rotates on said bearing shaft with

a multiplicity of grooves in said inner surface of said annular bearing element, said grooves extending angu-

larly along said inner surface of said annular bearing element.

4,167,220

SYSTEM FOR LUBRICATING THE BEARINGS OF CUTTING ROLLERS OF A ROLLER BIT

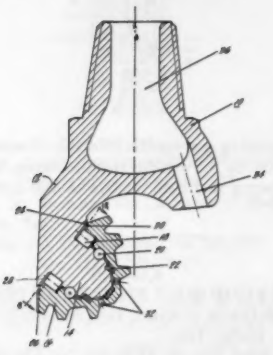
Horst M. Ernst, Eltingshausen; Armin Olschewski; Lothar Walter, both of Schweinfurt, and Manfred Brandenstein, Aschfeld, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 873,134

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703724

Int. Cl.[2] E21B *9/35*

U.S. Cl. 175—337 **9 Claims**



1. In a drilling apparatus including a bit body having at least one pivot and a cutting roller supported for rotation relative to the pivot and at least one bearing in an annular space between the cutting roller and pivot, the cutting roller and bit body having confronting faces defining an annular groove communicating with the annular bearing space, a system for lubricating the bearing with a flushing liquid comprising hydrodynamic pumping means including at least one groove on at least one of the confronting spaced faces of said cutting roller and bit body and at least one flow opening in the cutting roller communicating with the annular bearing space, said groove means being of a predetermined configuration so that upon rotation of said cutting roller in a predetermined direction, flushing liquid is pumped through the annular bearing space.

4,167,221

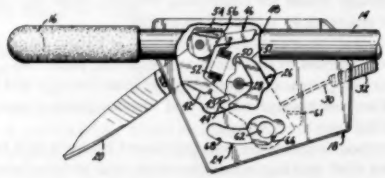
POWER EQUIPMENT STARTING SYSTEM

Orvan D. Edmonson, Apple Valley, and William D. Wood, Minneapolis, both of Minn., assignors to The Toro Company, Minneapolis, Minn.

Filed Aug. 3, 1976, Ser. No. 711,252

Int. Cl.[2] B62D *51/04*

U.S. Cl. 180—19 H **22 Claims**



1. A starting interlock system for power equipment having a main frame and an operator handle attached thereto, comprising:

a cam having first and second cam surfaces;

means pivotally mounting said cam to the operator handle for pivotal movement between first and second cam positions;

means biasing said cam toward said second cam position;

means for permitting pivoting said cam to said first cam position;

a dead man lever pivotally mounted to the operator handle for rotation between energization and release positions, corresponding to said first and second cam positions, respectively, said lever having a first contact surface that, in the energization position, engages the first cam surface in said first position and prevents said cam from rotating to said second position, and having a second contact surface that, in the release position, engages the second cam surface in said second position to lock said cam in said second position; and

means responsive to cam position for energizing the equipment when said cam is in said first position.

4,167,222

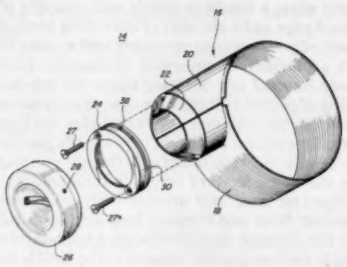
PASSIVE ANTI-THEFT DEVICE

Ahmed El Bindari, Brookline, Mass., assignor to Guardex Corporation, Salem, Mass.

Filed Nov. 14, 1977, Ser. No. 851,555

Int. Cl.[2] B60R *25/02*

U.S. Cl. 180—287 **17 Claims**



7. A passive anti-theft device for protecting ignition or anti-theft components mounted within the steering column of a vehicle from forced entry, comprising, in combination:

a. armored guard means for protecting said components within a vehicle steering column but permitting an ignition key to be inserted into an ignition key cylinder contained within the vehicle steering column, said armored guard means including a band portion which can be positioned around the ignition housing of a steering column, an integral split cylindrical portion which can be positioned around an ignition key cylinder housing, and a cover; and

b. means for permanently fastening said armored guard means around that portion of a vehicle steering column containing said components, said means for permanently fastening including a circular ring and means to fasten said circular ring to said cylindrical portion.

4,167,223

MECHANICALLY OPERABLE ACOUSTIC FILTER

Michel Liesse, La Bearnerie-Nesploy, 45270 Bellegarde, France

Filed Jun. 19, 1978, Ser. No. 916,840

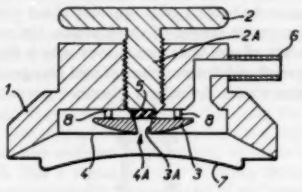
Claims priority, application France, Jun. 27, 1977, 77 19559

Int. Cl.[2] A61B *7/02*

U.S. Cl. 181—131 **10 Claims**

1. A mechanically operable acoustic filter for varying the acoustic spectrum of sound signals transmitted therethrough, comprising a housing having an inlet orifice for receiving input sound signals and an outlet orifice for output sound signals,

said orifices being disposed on opposite sides and spaced from a filtering diaphragm partitioning the interior of the housing into two chambers each in direct communication with a respective one of said orifices, the improvement comprising a tensioning member having an operative surface adapted to be brought into contact with said filtering diaphragm and in part setting-off a free vibrating surface area of said filtering diaphragm, adjustment means operative from outside said housing for varying the pressure exerted on said filtering diaphragm and progressively varying the tension of said free vibrating surface area, and the operative surface of said tensioning member being constructed and shaped so that the free vibrating surface area of said filtering diaphragm progressively diminishes or increases as the tension thereof increases or diminishes, respectively.



4,167,224

ESCAPE CHUTE

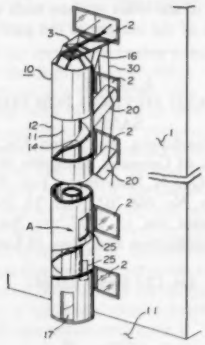
Takeo Kinase; Katsuo Orii; Hiroaki Hosaka, and Kiyoshi Ito, all of Sagamihara, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1977, Ser. No. 844,193

Claims priority, application Japan, Oct. 22, 1976, 51-142308[U]; Jun. 6, 1977, 52-73433[U]

Int. Cl.[2] A62B *1/20*

U.S. Cl. 182—48 **4 Claims**



1. An escape chute for a building comprising a framework connected to an upper part of the building; a chute body in the form of inner and outer concentric cloth cylinders which are adapted to be deployable so as to be vertically hangable from the said framework when in use; a cloth spiral slide surface fixed between said inner and outer cylinders; an upper entrance located adjacent the top of said outer cylinder; an exit located adjacent the bottom of said outer cylinder; at least one intermediate access aperture located at an intermediate portion of said outer cylinder; cloth intermediate entrance passages connecting each said access aperture to an aperture of the building; where said intermediate access apertures are located at a predetermined height above the point of contact of said spiral slide surface and said outer cylinder so that a person utilizing the chute will not become caught by the peripheral edge of the access opening.

4,167,225

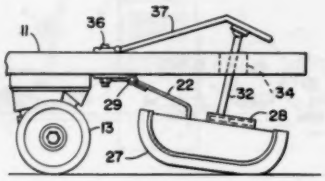
BRAKE ASSEMBLY FOR WHEELED PERSONAL VEHICLE

Raymond Fragoso, 1967 Courtland Ave., Oakland, Calif. 94601

Filed Mar. 20, 1978, Ser. No. 888,304

Int. Cl.[2] B60T *1/14*

U.S. Cl. 188—5 **1 Claim**



1. In a wheeled personal vehicle including a base member having front and rear wheel trucks extending subjacently therefrom, a brake assembly comprising hinge means secured subjacently to said base member; a brake shoe disposed rearwardly of said rear wheel truck and subjacently of said base member and secured to said hinge means for pivoting to selective frictional engagement with the pavement supporting said vehicle; spring means associated with said hinge means for biasing said brake shoe upwardly out of engagement with the pavement; a pedal pivotally secured to the upper rear surface of said base member; a slot extending longitudinally insaid base member beneath a portion of said pedal; a plunger extending through said slot; ball and socket joint means joining said pedal and the upper end of said plunger; said brake shoe including an upper channel portion having a longitudinal track therein; means for slidably securing the lower end of said plunger in said track; and at least one bolt and nut assembly extending through and commonly joining said hinge means, said pedal, and said base member.

4,167,226

CAPSULE TURNING APPARATUS (RANDOM SPIN PRINTING)

Edward M. Ackley, deceased, late of Stone Harbor, N.J. (by Edward M. Ackley, co-executor), Stone Harbor, N.J., and by James B. Ackley, co-executor, Cambridge, Ill., assignors to R. W. Hartnett Company, Inc., Philadelphia, Pa.

Division of Ser. No. 643,177, Dec. 22, 1975, Pat. No. 4,069,753, which is a continuation-in-part of Ser. No. 399,817, Sep. 24, 1973, Pat. No. 3,931,884. This application Aug. 30, 1977, Ser. No. 829,141

The portion of the term of this patent subsequent to Jan. 24, 1995, has been disclaimed.

Int. Cl.[2] B65G *47/24*

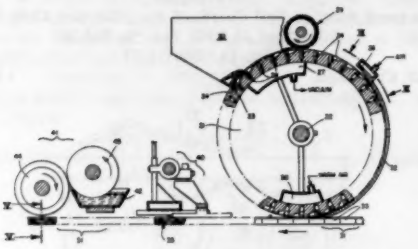
U.S. Cl. 198—397 **8 Claims**

1. In a pharmaceutical capsule transporting apparatus of the type having a continuously rotatable capsule transporting cylinder having a plurality of elongated upstanding spaced apart pockets, each pocket having a radially extending portion arranged to receive and transport a capsule in an upstanding position therein, means for rotating the cylinder, a conveyor carrying a plurality of capsule carriers, and means for transferring capsules from the cylinder pockets to the capsule carriers, the improvement comprising:

(a) a hopper having an opening therein, the opening located adjacent the capsule transporting cylinder to deliver capsules to the radially extending portion of each pocket;

(b) a plurality of holes, each of which extend through inner portions of the capsule transporting cylinder into the capsule pockets;

(c) a vacuum chest located adjacent to the inner surface of the cylinder and communicating with the pockets through the holes to assist in the delivery of the capsules from the hopper into the radially extending portion of each cylinder pocket in such manner that substantially an entire capsule is received in the radial portion;



(d) a perpendicular portion in each pocket being connected to the radial portion by means of a curved surface, the perpendicular portion being generally perpendicularly disposed with respect to the radial portion; and

(e) fluid jet means spaced close to the transport cylinder to shift the capsules from the radial portion of each pocket into the perpendicular portion of the pocket.

4,167,227

METHOD AND INSTALLATION FOR ORDERING GROUPS OF ARTICLES IN STACKS OR ROWS

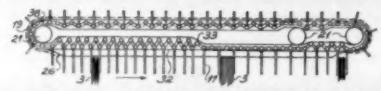
Jean-Louis Pichon; Désiré Lousteau, and Jean-Pierre Volat, all of Paris, France, assignors to "Hotchkiss Brandt Sogeme" H.B.S., Paris, France

Filed Feb. 28, 1978, Ser. No. 882,171

Claims priority, application France, Mar. 1, 1977, 77 05935

Int. Cl.[2] B65G *47/28*

U.S. Cl. 198—456 **15 Claims**



1. Method of ordering groups of articles in stacks or rows which may then be dispensed one by one by a dispensing device, comprising the steps of:

inserting the groups of articles between pressure members which are driven in displacement,

causing the pressure members to move apart from one another along a path corresponding to a jogging zone whilst their overall speed of advance remains the same, and at the same time the articles making up a group propelled towards a wall forming a vertical abutment so as to cause said articles to align themselves by one of their edges,

closing up said pressure members again along a path corresponding to an extracting zone before the articles arrive at the dispensing device.

4,167,228

CONTAINERS

Jeffery J. Cheetham, 5 Brunsdon St., Bayswater, Victoria, Australia (3153)

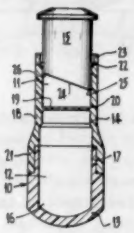
Filed Mar. 7, 1977, Ser. No. 774,950

Claims priority, application Australia, May 5, 1976, PC5817; Oct. 18, 1976, PC7760

Int. Cl.[2] B65D *25/08*

U.S. Cl. 206—222 **10 Claims**

1. A container comprising means defining a chamber separated into first and second compartments, the first compartment being arranged to contain a first component of a composition and the second compartment being arranged to contain a second component of the composition, said means defining the chamber comprising a wall means having a closed end and an open end, a partition integrally formed with the wall means, and a plunger slidingly and sealingly located in the open end of the wall means, said plunger having an inner end surface spaced from the partition, the inner surface of the plunger being inclined at an acute angle to the partition and having a leading edge and a trailing edge movable along said wall means during a depression stroke of the plunger, the portion of the interior surface of said wall means over which the leading and trailing edges of said inner surface of said plunger move during its depression stroke defining a chamber portion of uniform



lateral dimensions such that said edges sealingly engage said wall means over the full depression stroke, said first compartment being defined by part of the wall means, said partition and the inner surface of said plunger, and the second compartment being defined by the closed end of the wall means and the partition, whereby upon the plunger being depressed the leading edge of the inner surface first separates a corresponding portion of the margin of the partition from the wall means, and then the partition is hinged toward the second compartment by progressive contact with the inner surface and corresponding progressive separation of the margin of the partition from the wall means, the stroke of the plunger being limited to contact of the trailing edge of the inner surface with a corresponding unseparated portion of the margin of the partition.

4,167,229

SCREW STRIP AND METHOD FOR FORMING THE SAME

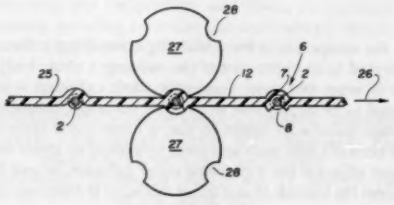
Siegfried Keusch, Plochingen, and Anton Abt, Oberboihingen, both of Fed. Rep. of Germany, assignors to Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Continuation of Ser. No. 666,702, Mar. 15, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 805,924

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1975, 2512825

Int. Cl.[2] B65D *85/24*

U.S. Cl. 206—343 **7 Claims**



1. In a unitary holding strip made of extruded plastics material comprising a plurality of screws retained in a row by said strip which defines a strip plane, said screws having longitudinal axes and a threading with a given outer thread diameter,

said unitary holding strip including a plurality of screw holding sleeves and lands interconnecting said screw holding sleeves each of which extends along a portion of the threaded length of the respective screw in the longitudinal direction of the screw, the improvement wherein the wall thickness of said lands and the wall thickness of the sleeves are substantially equal to each other and substantially smaller than said outer thread diameter, wherein said lands interconnecting said sleeves extend in said strip plane, said screws having longitudinal axes substantially located in said strip plane, said sleeves and lands being formed by extruding said plastics material from one side only relative to said strip plane and perpendicularly to said longitudinal axes of the screws so that said sleeves non-uniformly surround said screws and form inwardly facing screw threads which closely conform to and hold said screw threading, said sleeves further comprising along the side opposite said one side thereof, substantially between said lands as a result of said non-uniform surrounding, an area of reduced strength such that a screw when it is being threaded into a workpiece is automatically screwed out of and separated from its sleeve while said sleeves and lands remain in one substantially intact strip, whereby each of said sleeves guides its screw by its inwardly facing screw threads as a screw is screwed out of its sleeve.

4,167,230

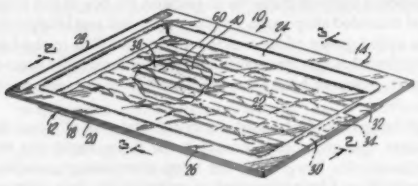
DISPOSABLE RECEIVER

Don C. Barratt, 1255-3B Weathervane La., Akron, Ohio 44313

Filed Jul. 26, 1978, Ser. No. 928,251

Int. Cl.[2] A61L *17/02*

U.S. Cl. 206—380 **10 Claims**



1. A receiver for securely encasing pointed disposable surgical implements for disposal, comprising:

(a) a tray having a bottom wall, side walls extending upwardly from said bottom wall and a flange extending outwardly around the upper periphery of said side walls;

(b) a cover having a configuration similar to said tray;

(c) a portion of the flange on said cover being hingedly connected to a portion of the flange on said tray so that said cover may be placed over and nested in said tray with the bottom wall of said cover in close proximity to the bottom wall of said tray to securely encase implements in an enclosure formed therebetween; and

(d) means on said bottom wall for receiving said implements comprising a yieldable plastic material and occupying substantially the entire enclosure.

4,167,231

NEEDLE CASE

Masamitsu Takahashi, 3-3, 2-chome, Kusunoki-cho, Hiroshima-shi, Hiroshima-ken, Japan

Filed May 12, 1978, Ser. No. 905,189

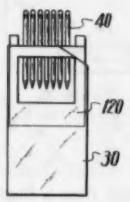
Claims priority, application Japan, Sep. 1, 1977, 52-117619[U]; Nov. 10, 1977, 52-150805[U]; Nov. 10, 1977, 52-150806[U]

Int. Cl.[2] B65D *85/24*

U.S. Cl. 206—382 **2 Claims**

1. A needle case comprising:

(a) a substantially rectangular shaped needle holder piece which comprises a first division with a lower end, said first division having a first rectangular opening therein and a second division with an upper end, said second division having a second rectangular opening therein, said lower and upper ends being hingedly connected, said second division also having a needle holder portion at said upper end alongside said hinge connection, whereby a plurality of needles can be suitably supported through said needle holder portion so as to locate each needle point within said second opening; and,



(b) a transparent cover fitted over said needle holder piece, whereby, when said needle holder piece is drawn upwards relative to said cover so that said cover ends at the upper end of said second division in the direction of removing said needle holder piece and then said first division is inclined backwards at a desired angle, said needles will then be easy to remove and replace.

4,167,232

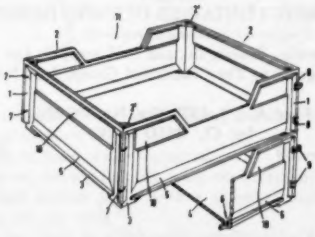
BOX COMPOSED OF PRESSED MATERIALS FOR SHIPPING FRUITS, VEGETABLES

Edmund Munk; Gerd Weinberg, and Hermann Henke, all of Oberstenfeld, Fed. Rep. of Germany, assignors to J. F. Werz Jr. KG Werzalit-Prssholzwerk, Oberstenfeld, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,445

Int. Cl.[2] B65D *21/02*

U.S. Cl. 206—509 **10 Claims**



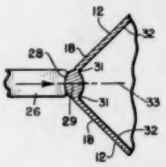
1. A box composed of individual pressed material parts and suited for shipping of fruits, vegetables, etc. and adapted for stacking, said box comprising two pairs of substantially flat panels of generally equal shape; a bottom wall member of the box; and longitudinal upper edges of the panels being turned outwardly and then upwardly to form an upper shoulder which is outwardly bounded by the upwardly turned portion of the respective upper edges, and longitudinal lower edges being turned inwardly and downwardly so as to form a lower shoulder adapted to support said bottom wall member of the box, the downwardly turned portion of the respective lower edge of an upper box in a stack being receivable within the confines of the upwardly turned portions of the upper edges of a lower box in the stack and to rest on said upper shoulder of the same.

4,167,233

BAKING PAN

Wilbert K. Hare, Lemont, Ill., assignor to Ekco Products, Inc., Wheeling, Ill.

Filed Jun. 27, 1977, Ser. No. 810,119
Int. Cl.[2] B65D 7/42, 21/02
U.S. Cl. 220—72 1 Claim



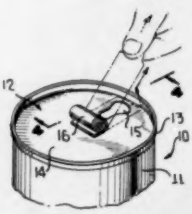
1. A bake pan formed from a single blank of sheet metal having a bottom wall of rectangular plan and side walls of equal and uniform thickness extending upwardly from said bottom wall, adjacent side walls being joined by an integral corner post formed to provide a columnar mass of metal lying within the point of intersection of the imaginary planes of the outer surfaces of said adjacent side walls, each corner post having a smooth inner curved surface and a smooth outer curved surface and having a cross-section configuration of elliptical shape wherein the two ends defining the extent of the inner curved surface of each corner post form definable junctures with the inner surface of each adjacent side wall and the two ends defining the extent of the outer curved surface of each corner post form definable junctures with the outer surface of each adjacent side wall, said inner and outer surfaces of the corner post defining a corner post thickness at the crossing of the minor axis of said elliptical shaped corner post, and said thickness being at least more than twice the thickness of an adjacent side wall.

4,167,234

SELF-STORING CONTAINER OPENING DISPENSING TAPE

Gerald A. Gordon, Skokie, Ill., and Karl Josephy, Los Angeles, Calif., assignors to The Continental Group, Inc., New York, N.Y.

Filed Aug. 1, 1978, Ser. No. 930,096
Int. Cl.[2] B65D 41/00
U.S. Cl. 220—359 15 Claims



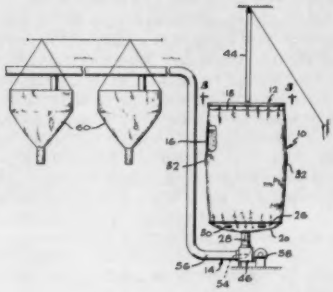
1. A new article of manufacture comprising a self-coiling tape for sealing a dispensing opening, said tape being a laminate of first and second materials and having a normal planar static state, said first material being a load bearing material, and said second material being a rubbery material, said tape having inner and outer surfaces when in the position of intended use, and said first material being innermost.

4,167,235

LOOSE FILL DISPENSING AND STORAGE SYSTEM

James R. Green, Buena Park, Calif., assignor to Altainer, Inc., Pico Rivera, Calif.

Filed Feb. 17, 1976, Ser. No. 658,413
Int. Cl.[2] B65D 33/14
U.S. Cl. 222—105 5 Claims



1. A dunnage container for storing, shipping and dispensing loose fill packaging material comprising:

a pliant, substantially static free elongated bag having a nominal extended shape when filled and comprising a cylindrical wall, a lower end providing a tapered lower hopper when extended and an upper end;

the upper end having means disposed circumferentially thereabout for attachment to plural circumferentially disposed support elements to suspend the bag in the nominal extended shape adjacent the upper end and comprising an upper group of spaced-apart rings coupled to the bag, the rings being supportable on a circumferentially spaced-apart group of hooks to suspend the bag in a dispensing mode;

a stiff hoop extending about the cylindrical wall adjacent the lower end and means coupling the hoop about the bag adjacent the lower end, the hoop comprising a resilient material and being coupled to maintain the bag adjacent the lower end radially extended to the nominal shape when the upper end is coupled to bag supports to thereby limit downward bag elongation and droop of the lower end even when the bag contains only a small quantity of loose fill packaging material, the means coupling the hoop about the bag adjacent the lower end comprising a lower group of spaced-apart rings disposed circumferentially adjacent the lower end and coupled to the bag, each ring encircling the hoop;

a conduit defining neck extending from the lower end including aperture means for dispensing loose fill packaging material, the bag thereby providing a lightweight portable loose fill packaging storage and dispensing container which substantially maintains its longitudinal shape during use, is collapsible for convenient transport when empty and may easily be positioned to dispense packaging material, the neck comprising a flexible material to enable the neck to conform to various conduit and coupling diameters and to be manually crimped to prevent packaging material from escaping when the bag is transported and when not in use;

at least one vent for allowing passage of air yet preventing passage of packing material to allow the bag to release air in a filling mode when suspended in an inverted vertical position in which the lower end is directed generally upward;

the vent comprising a mesh patch disposed on the lower end;

an upper group and a lower group of spaced-apart tabs, each tab being looped about a different ring of the upper group and the lower group of spaced-apart rings and fastened to

the bag adjacent respective upper and lower ends to flexibly couple the upper and lower rings thereto; and

the bag further comprising means disposed on the outer cylindrical wall to manually grasp and carry the container when extended with packing material.

4,167,236

APPARATUS FOR THE FEEDING OF LIQUID SYNTHETIC RESIN COMPONENTS

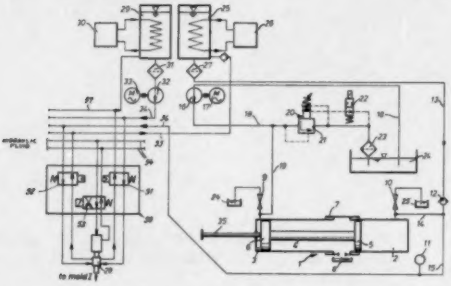
Peter Taubenmann, Munich, Fed. Rep. of Germany, assignor to Krauss-Maffei, Munich, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 782,962

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613771

Int. Cl.[2] B67D *5/02*

U.S. Cl. 222—135 **2 Claims**



1. An apparatus for dosing a liquid synthetic-resin component to a mixing head which comprises:

a displacement unit comprising a cylinder and a piston in said cylinder subdividing same into a first chamber adapted to receive said component and connected to said mixing head, and a second chamber;

a variable-displacement axial-piston pump having a variable piston stroke per revolution, said pump being connected to said second chamber for feeding a hydraulic medium thereto at a variable rate, thereby displacing said piston to drive said component to said mixing head;

a source of said component;

a conduit connecting said source with said first chamber;

a check valve in said conduit permitting said component to flow from said source to said first chamber but preventing reverse flow of said component from said first chamber to said source;

a reservoir for said hydraulic medium at atmospheric pressure, a duct connecting said reservoir with the intake side of said pump, a further duct connecting the discharge side of said pump with said reservoir; and

valve means in said further duct openable to permit recirculation of said medium from said reservoir through said pump and back into said reservoir during the filling of said first chamber, the effective surface areas of said piston of said displacement unit in the respective chambers being different.

4,167,237

PRESSURE FEEDER INCLUDING PUSHER ASSEMBLIES

Torahiko Hayashi, 3-4, Nozawa-machi, Utsunomiya-shi, Tochigi-ken, Japan

Filed Nov. 25, 1977, Ser. No. 854,908

Claims priority, application Japan, Nov. 27, 1976, 51-142760

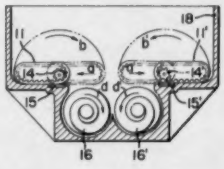
Int. Cl.[2] G01F *11/00*

U.S. Cl. 222—265 **8 Claims**

1. A pressure feeder for feeding solid or semi-fluid material plastic in nature from a container into or through a relatively narrow outlet, comprising

a container for the material, with an outlet at the bottom thereof, and

a pusher assembly comprising a hollow cylindrical pusher member oval-shaped in cross-section and provided with a gear along the inner periphery of the wall thereof, a driven pinion gear rotatably mounted on the container, and a holder fixedly mounted on the container at a position spaced apart from said pinion gear a distance equal to the width of said wall of said pusher member,



said pusher member being placed so that said pinion gear comes within the hollow portion thereof and in meshing engagement with the gear of the pusher member and is simultaneously supported on the outer periphery of said wall by said holder, thereby to carry out repeated movement consisting of a linear movement followed by a turning movement about said pinion gear.

4,167,238

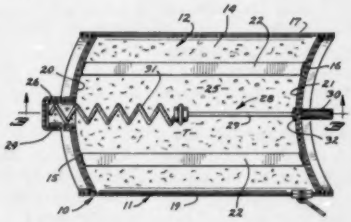
TOBACCO POUCH WITH EJECTOR MECHANISM

Philip A. Koski, 7588 Groveland Rd., Minneapolis, Minn. 55432

Filed Jan. 9, 1978, Ser. No. 867,898

Int. Cl.[2] G01F *11/20*

U.S. Cl. 222—413 **1 Claim**



1. In a tobacco pouch for containing and dispensing a quantity of pipe tobacco,

(a) a bag of flexible sheet material,

(b) said bag having flat side walls connected by front, rear, top and bottom walls with a zipper closure extending along the top wall,

(c) the bag held in a distended condition by a framework having rigid front and rear ribs extending along the bag front and rear walls and elongated members interconnecting the ribs for retaining the ribs in longitudinally spaced condition,

(d) the front rib having an aperture at the longitudinal center thereof which receives and secures the end of a discharge tube which extends through an opening in the front wall of the bag,

(e) a spiral spring auger member disposed within the bag in axial alignment with the tube and having one end fitting loosely within the tube, and

(f) a handle member connected to the auger member and extending through the rear rib and rear wall whereby as the handle member is rotated the auger member will move tobacco within the bag toward and outwardly through said opening and tube.

4,167,239

FEEDING APPARATUS FOR STEPWISE FEEDING OF CONTINUOUS ELONGATED MATERIAL

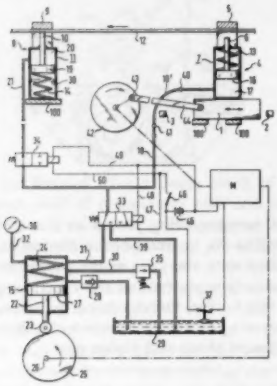
Otto Bihler, Schleiferweg 2, D-8959 Halblech, Fussen, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,342

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1977, 2711693

Int. Cl.[2] B65H *17/36*

U.S. Cl. 226—150 **10 Claims**



1. Feeding apparatus for feeding continuous, elongated material in a longitudinal path in sequential steps comprising:

(a) a support;

(b) a slide mounted on said support for reciprocating movement in a predetermined direction;

(c) two clamping devices spaced on said support in said direction, each device including a base portion and an operating portion movable relative to the base portion between two terminal position,

(1) one of said portions including a cylinder member enclosing a cavity therein, and the other portion including a piston member movable in said cavity and bounding a compartment of said cavity,

(2) said members being secured to respective clamping jaws positioned for clamping said material therebetween in one terminal position of said operating portion and for releasing said material in the other terminal position of said operating portion;

(d) common pressure fluid supply means connected to said compartments for cyclically supplying pressure fluid to said compartments and for simultaneously shifting the operating portion of one of said clamping devices into said one terminal position thereof and the operating portion of the other clamping device into said other terminal position thereof by the pressure of the supplied fluid;

(e) first return means responsive to a decrease in the pressure of said fluid to a first value for shifting the operating portion of said one clamping device from said one terminal position toward the other terminal position;

(f) second return means responsive to a decrease in the pressure of said fluid to a second value different from said first value for shifting the operating portion of said other clamping device from said other terminal position toward said one terminal position thereof;

(g) fastening means fastening the base portion of a first one of said clamping devices to said slide for reciprocating movement therewith, the base portion of the second clamping device being secured to said support against movement with said first fastening device; and

(h) actuating means for actuating said reciprocating movement and for varying said pressure in timed sequence.

4,167,240

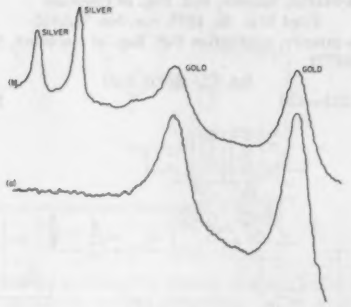
METHOD OF TREATING AN ELECTROPLATING SOLUTION COMPRISING IONS OF GOLD AND CYANIDE PRIOR TO ELECTROPLATING AND THERMOCOMPRESSION BONDING

Theodore F. Schaaf, Lawrenceville, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,459

Int. Cl.[2] B23K *19/00*

U.S. Cl. 228—196 **7 Claims**



5. A method of improving a bond between a first surface and a second surface having an electroplated gold deposit thereon, which comprises:

(a) treating a gold electroplating solution, containing a dissolved gold cyanide salt therein, with metallic gold to precipitate silver metal therefrom;

(b) removing said precipitated silver metal to form an essentially silver species free electroplating solution;

(c) treating the second surface with said silver species free electroplating solution to deposit an essentially silver metal free gold deposit thereon; and

(d) bonding the first surface to said gold deposited second surface.

7. The method of improving a bond between a first surface and a second surface as recited in claim **5** wherein said step of treating said gold electroplating solution with metallic gold comprises contacting said solution with a fine particle size inert material having a film of metallic gold on the surface thereof.

4,167,241

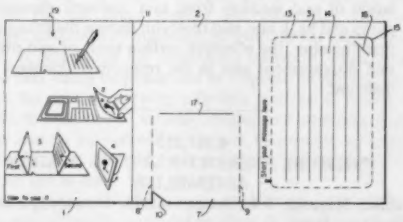
LETTER ENVELOPE AND DISPLAY

Robert Zumbrunn, Brunnenwiese 35, 8610 Uster, Switzerland

Filed Sep. 12, 1977, Ser. No. 832,579

Int. Cl.[2] B42D *15/04*; G09F *1/12*

U.S. Cl. 229—928 **7 Claims**



1. A combined letter envelope and display frame device for mailing and displaying articles such as photographs, said device comprising:

a single piece of light cardboard or paper material folded into at least two panels;

a first of said panels having on one side thereof adhesive

that said window portion may be selectively manually removed along said perforations, thereby displaying said article attached to said one side of said first panel, after said device has been received in the mail by an intended recipient;

one of said panels forming a back cover of said device and having therein a selectively manually movable supporting leg for supporting said device when employed as a display frame, said supporting leg being defined by a pair of lines of perforations extending through said one panel; and

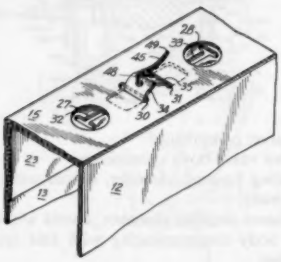
said back cover having an outer side having printed thereon mailing indicia for the receipt of the mailing address of the intended recipient of the letter envelope.

4,167,242

CARTON SEAL

Julius B. Kupersmit, 148-80 228th St., Springfield Gardens, N.Y. 11413

Filed Jun. 1, 1978, Ser. No. 911,372
Int. Cl.[2] B65D *45/00*
U.S. Cl. 229—45 R **2 Claims**



1. In a portable carton of the type which is maintained in closed condition by the engagement of a flexible handle having enlarged ends penetrating openings in an outer wall and engaging non-circular openings in an inner wall disposed there beneath, the improvement comprising: said inner wall having a plurality of orificed bendable tabs cut from the plane of said inner wall and disposed substantially at right angles with respect to the plane thereof; said outer wall having corresponding openings therein, positioned to overlie said tabs when said carton is in closed condition, said tabs projecting through said last mentioned opening; and a frangible seal penetrating the orifices in said tabs to lock said carton in closed condition.

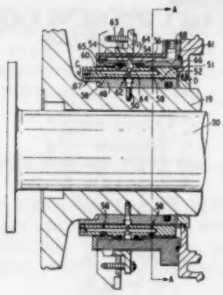
4,167,243

SCROLL DISCHARGE DECANTER CENTRIFUGES

Joseph F. Jackson, Halifax, England, assignor to Thomas Broadbent & Sons Limited, Huddersfield, England

Filed Sep. 19, 1977, Ser. No. 834,595
Claims priority, application United Kingdom, Sep. 22, 1976, 39189/76
Int. Cl.[2] B04B *3/04*
U.S. Cl. 233—7 **7 Claims**

1. In a scroll discharge decanter centrifuge of the type in which the interior of the centrifuge is to be kept sealed from the atmosphere, and which comprises a stationary assembly which includes an outer casing, a rotary assembly which includes a solid bowl which is adapted to be rotated within the stationary casing at a first speed and a scroll conveyor which is rotatable within the bowl at a second, slightly different speed, the improvement comprising a sealing device effective between the rotary assembly and the stationary assembly, said sealing device comprising a first ring fixed relative to the stationary assembly, a second, coaxial ring which rotates with the rotary assembly, a plurality of gas jet nozzles contained in that surface of said first ring which faces said second ring, said gas jet nozzles enabling pressurized gas to be supplied to an annular clearance gap between said first and second rings, a further annular member which is stationary relative to one of said rings, and elastomeric seal means sealing said one of said rings of said sealing device to said further annular member to



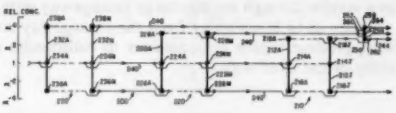
permit said one of said rings to have a predetermined amount of radial and angular freedom relative to said further annular member for accommodating misalignment between the rotary and stationary assemblies.

4,167,244

GAS-CENTRIFUGE UNIT AND CENTRIFUGAL PROCESS FOR ISOTOPE SEPARATION

Thomas M. Stark, Morristown, N.J., assignor to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed Nov. 11, 1976, Ser. No. 741,153
Int. Cl.[2] B04B *5/08;* B01D *45/12*
U.S. Cl. 233—18 **50 Claims**



1. An isotope-enrichment unit for separating a gaseous-mixture feedstock including a compound of a light nuclear isotope at a predetermined concentration and a compound of a heavy nuclear isotope at a predetermined concentration into at least two unit-output fractions including a waste fraction depleted in the light isotope to a predetermined concentration and a product fraction enriched in the light isotope to a predetermined concentration, comprising:

(a) a first group of cascades of gas centrifuges, each cascade having an enriching stage, a stripping stage, an input, a light-fraction output, and a heavy-fraction output for separating the gaseous-mixture feedstock into light and heavy gaseous-mixture fractions;

(b) means for introducing the gaseous-mixture feedstock into each input of the first group of cascades;

(c) means for withdrawing at least a portion of a product fraction from light-fraction outputs of the first group of cascades;

(d) means for withdrawing at least a portion of a waste fraction from heavy-fraction outputs of the first group of cascades;

(e) an auxiliary cascade having an input, a light-fraction output, and a heavy-fraction output;

(f) a first conduit connected between an output of a first cascade included in the first group and the input of the auxiliary cascade for directing at least a portion of a gaseous-mixture fraction produced by the first group of cascades into the auxiliary cascade for further separation into a light fraction and a heavy fraction; and

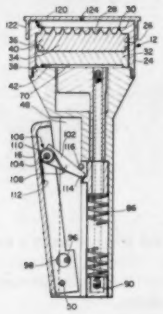
(g) means for withdrawing at least a portion of a unit-output fraction from an output of the auxiliary cascade.

4,167,245

SPRAY DISPENSING

Ronald W. Kock; Theodore P. Merz, and Paul K. Platt, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 1, 1977, Ser. No. 820,508
Int. Cl.[2] B05B *1/08*
U.S. Cl. 239—11 **64 Claims**



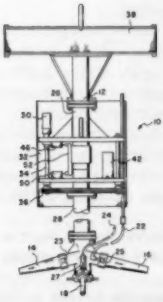
1. Method of dispensing a metered quantity of a preferably semi-liquid product from a filled substantially rigid container having a fixed wall provided with at least one generally open and unobstructed discharge passageway and a moveable wall spaced apart from the fixed wall comprising impacting the moveable wall with a moving mass to induce a pressure pulse of very short time duration in the product sufficient to surge a metered quantity of product less than the entire content of the container and dependent upon the momentum of the moving mass as a noodle through the discharge passageway with sufficient velocity as to break away from the passageway and the remaining product within the container to ballistically travel outwardly of the fixed wall.

4,167,246

APPARATUS FOR SPRAYING REFRACTORY LINING

Jan F. Haus, Allison Park, Pa., assignor to J. G. Spin-L, Inc., Carnegie, Pa.

Filed Nov. 21, 1977, Ser. No. 853,247
Int. Cl.[2] B05B *3/00*
U.S. Cl. 239—227 **13 Claims**



1. A lining gun for spraying a refractory lining on the interior of deep walled refractory bodies such as ladles and the like comprising:

an elongated conduit through which refractory material can be conveyed;

at least one pair of discharge nozzles mounted adjacent one end of said conduit and being capable of being in fluid communication with said conduit, said nozzles extending outwardly from said conduit in substantially diametrically opposed directions; and

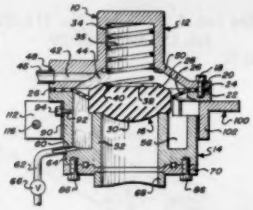
drive means for driving said nozzles in a rotary manner about the axis of said conduit, said drive means alternately rotating said nozzles in a first direction through an angle of approximately 360° and then in the reverse direction through an angle of approximately 360°.

4,167,247

SPRAY CONTROL APPARATUS

Mack D. Sons, 9818 Green Ave. NW., Albuquerque, N. Mex. 87114, and William F. Schlegel, 4437 Linden La. NE., Albuquerque, N. Mex. 87111

Filed Jan. 6, 1978, Ser. No. 867,365
Int. Cl.[2] B05B *1/32;* F16K *31/165*
U.S. Cl. 239—455 **6 Claims**



1. Spray valve, comprising:

(a) An upper valve body comprising:

(1) A spring housing chamber, a void within said upper valve body;

(2) A control pressure chamber, a void within said upper valve body communicating with said spring housing chamber;

(3) Control pressure port means for conveying a pressurized control fluid from outside said upper valve body into said control pressure chamber;

(b) First securing means, for securing said upper valve body to a lower valve body and a diaphragm-seating member;

(c) Said diaphragm-seating member, held between said upper valve body and said lower valve body by said first securing means, comprising:

(1) An outer portion in the form of a thin diaphragm of pliable, stretchable material;

(2) An upper convex central portion forming a spring seating member, having a spring seating recess, a shallow cylindrical recess in the upper surface of said spring seating member;

(3) A lower convex central portion forming an upper valve seating member, having an upper valve seating surface, a flat annular surface around its outer perimeter;

(d) A spring, housed within said spring housing chamber of said upper valve body, with the lower end of said spring bearing against said spring seating member of said diaphragm-seating member, and being secured within said spring seating recess of said spring seating member;

(e) Said lower valve body, secured to said upper valve body and said diaphragm-seating member by said first securing means, comprising:

(1) A spray conduit, a tubular void leading into said lower valve body, for transmission of spray fluid within said lower valve body;

(2) A lower valve seating surface adjacent to the interior end of said spray conduit, being a flat annular surface having the same dimensions as said upper valve seating surface of said upper valve seating member of said diaphragm-seating member;

(3) A spray holding chamber, a void communicating with said spray conduit when said upper valve seating surface is not in contact with said lower valve seating surface;

(4) A spray orifice, an orifice in the wall of said lower valve body leading from said spray holding chamber to the outside of said lower valve body, for emission of spray fluid from said lower valve body;

(f) Second securing means, for adjustably securing a spray pattern control means to said lower valve body;

(g) Said spray pattern control means, adjustably secured to said lower valve body by said second securing means, for controlling the rate and pattern of flow of said spray fluid from said spray orifice when said spray valve is open.

4,167,248

DEVICE FOR DISENTANGLING AND SPREADING SHORT STEEL FIBERS

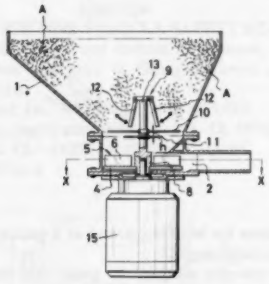
Haluichi Akazawa, c/o Isaku Nishi, 5, Higashifukunokawa-cho, Okazaki, Sakyo-ku, Kyoto-shi, and Kiyoshi Okada, 22-5, Yoshidakonoecho, Sakyo-ku, Kyoto-shi, both of Japan, assignors to Haluichi Akazawa; Kiyoshi Okada, both of Kyoto and Yoshiro Mizoguchi, Hirakata, all of, Japan

Filed Jun. 27, 1977, Ser. No. 810,404

Claims priority, application Japan, Jul. 1, 1976, 51/078712

Int. Cl.[2] A01C *17/00*

U.S. Cl. 239—683 **1 Claim**



1. Apparatus for disentangling and spreading short steel fibers, said apparatus comprising:

a hopper for holding the short steel fibers, said hopper having a constricted opening at the bottom thereof and being configured with an aperture below said opening oriented generally perpendicularly with respect to the vertical axis of the hopper;

a nozzle mounted to said aperture wherein the interior of said hopper communicates with the interior of said nozzle through said aperture, said nozzle being oriented in a direction generally in alignment with said aperture, substantially perpendicular to said axis of said hopper;

a disc mounted for rotation at the base of said hopper, the plane of said disc being below said opening and being substantially perpendicular to said axis of said hopper and aligned with said nozzle;

a motor connected to said disc for rotation thereof;

a plurality of upstanding plate-shaped members mounted to said disc and oriented generally in a radial direction from the axis thereof;

a central boss mounted on the axis of said disc and extending upwardly into and parallel to said axis of said hopper;

a first set of vanes mounted to and radially extending from said boss and spaced from said disc;

a second set of vanes mounted to and radially extending from said boss and spaced from said disc, said second set of vanes being spaced from said first set of vanes by a predetermined distance, the vanes of said first and second set of vanes alternating circumferentially around said boss, being located in the vicinity of said constricted opening, and having a combined vertical projection surface area between 70% and 100% of the surface area of said disc; and

a plurality of rigid arms pivotally mounted to the top of said boss, said arms pivoting outwardly upon rotation of said boss, said arms hanging downwardly when said boss is not rotating;

whereby short steel fibers are disentangled by said arms, fed in a measured manner to said disc by said vanes and distributed evenly through said nozzle by said plate-shaped members on said rotating disc when said disc is rotated, said vanes preventing the steel fibers from dropping onto said disc when said disc is stopped.

4,167,249

STOCK PULPER FOR PULPING AND SORTING WASTE PAPER

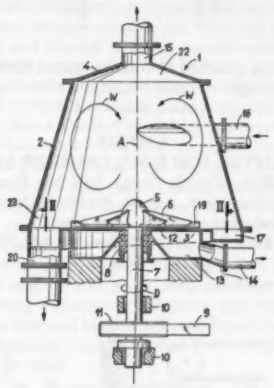
Manfred Kohrs, Ravensburg, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 7, 1977, Ser. No. 849,258

Claims priority, application Switzerland, Nov. 16, 1976, 14381/76

Int. Cl.[2] B02C *23/36*

U.S. Cl. 241—46.17 **6 Claims**



1. A stock pulper for pulping waste paper and for sorting a recovered stock suspension, said stock pulper comprising;

an enclosed container having essentially the form of a body of revolution with a bottom end wall, a conical circumferential wall extending from said bottom end wall on a vertical axis with an upwardly directed apex and a conical top end wall extending from said circumferential wall and having an upwardly directed apex;

a screen in said bottom end wall;

a rotor having a plurality of arms disposed adjacent to said screen to pulp good stock through said screen;

an inlet for introducing a waste paper suspension into said container;

a first outlet in communication with said screen to remove good stock from said container;

a second outlet in communication with a lower portion of said container for removing impurities of heavy specific gravity from said container; and

a third outlet located in said top end wall on said axis for removing impurities of low specific gravity from said container.

4,167,250

SEQUENTIAL VELOCITY DISK REFINER

Charles W. McMillin, and Peter Koch, both of Alexandria, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

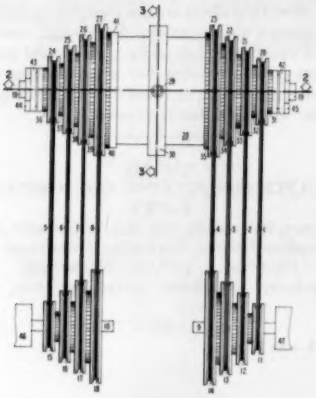
Filed Apr. 19, 1978, Ser. No. 897,811

Int. Cl.[2] B02C *7/06, 7/12*

U.S. Cl. 241—251 **5 Claims**

1. In a double-disk refining apparatus having counter-rotat-

ing disks for refining wood fibers the improvement wherein each disk comprises a plurality of concentric rotatable rings,



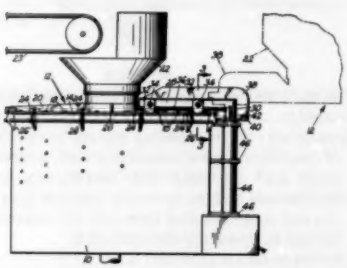
said rings being attached to rotating means for independently rotating said rings.

4,167,251

LIFTER FOR ROCK CRUSHER LID

William F. Burr, Tigard, Oreg.; Neil M. Rose, Vancouver, Wash., and Stephen B. Ackers, Portland, Oreg., assignors to Canica Crushers, Ltd., Vancouver, Wash.

Filed Sep. 26, 1977, Ser. No. 836,377
Int. Cl.[2] B02C *23/00*
U.S. Cl. 241—285 A **7 Claims**



1. A remotely operated lifter for removing the lid of a rock crusher of the type having an exterior shell and a lid removably enclosing the open upper end of said shell, the lifter comprising:

(a) a support arm removably attached to said lid, and extending outwardly thereof;

(b) a lifting arm joined to said support arm outwardly of said crusher shell;

(c) sleeve bearing means journaling said lifting arm in a manner for raising and lowering of said lid from said crusher shell upon appropriate translation of said lifting arm in said sleeve bearing means and for rotation of said lid with respect to said crusher shell upon rotation of said lifting arm in said sleeve bearing means;

(d) reciprocative actuation means located within said sleeve bearing means and operatively associated with said lifting arm in a manner for translating said lifting arm with respect to said sleeve bearing means; and

(e) thrust bearing means located within said sleeve bearing means and interconnecting said reciprocative actuation means and said lifting arm, for allowing rotation of said lifting arm relative to said reciprocative actuation means while said lift lid is being lifted.

4,167,252

STRAND COLLECTING APPARATUS AND METHOD

Jerome P. Klink, and Arnold J. Eisenberg, both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 724,825, Sep. 20, 1976, abandoned. This application May 1, 1978, Ser. No. 901,546
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—18 G **8 Claims**

1. Apparatus for winding strand as a package onto a rotatable collet comprising:

a strand traverse adapted to guide said strand onto said collet;

a strand guide means adapted to guide said strand onto said strand traverse, said strand being guided along a first path from said strand guide means to said strand traverse and a second path from said strand traverse to said package, an angle being formed therebetween at said strand traverse, said angle having an obtuse component angle lying in a plane perpendicular to the axis of rotation of said rotatable collet; and,

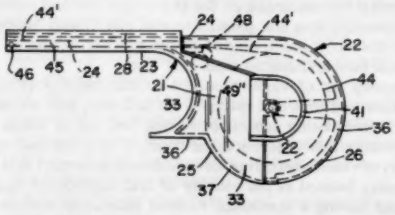
means for moving said strand guide means during winding to control said obtuse component angle as the diametral size of said package increases.

4,167,253

DISPENSER

Almer J. Rutz, Box 816, Riverdale, N. Dak. 58565

Filed Nov. 2, 1977, Ser. No. 847,758
Int. Cl.[2] B65H *19/00*
U.S. Cl. 242—55.53 **2 Claims**



1. A bandage roll dispenser comprising a front and rear housing adapted to be mounted together, said front housing

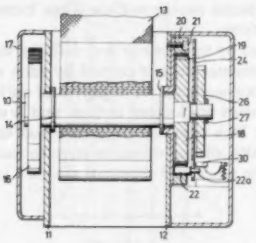
having a front wall with a horizontal channel at the top of the front wall, said front housing having cylindrical side discs mounted to the edges of the front wall, said rear housing having partial discs on each side stepped outward to overlap the rear half of the discs of the front housing, said rear housing having a curved cylindrical back wall, said rear housing having a top plate extending forward into the channel of the front housing, said roll of bandage within the front and rear housing, the outer end of the roll of bandage extends outward from within the front and rear housing between the channel and top plate of the front and rear housing to dispense the roll of bandage, said housing channel of said front housing has a raised ridge extending across the front housing channel to frictionally engage the gauze against the underside of the top portion to provide a drag on the gauze passing therethrough, said top plate, having a narrow horizontal ridge rearwardly projecting from the top plate and rearwardly projecting from the top of the front wall of the front housing providing a narrow ledge over the forward portion of the top of the front housing, so that as the roll of gauze becomes rather small, unwinding near the end of the roll, it will be drawn up against the ridge and the ridge helps to keep the roll from jamming.

4,167,254

LOCKING DEVICE FOR VEHICLE SAFETY SEAT BELTS

Hannu O. Paitula, Jarna, and Roland A. Larsson, Stidertälje, both of Sweden, assignors to Granges Essem Aktiebolag, Vasteras, Sweden

Filed Jul. 7, 1977, Ser. No. 813,693
Claims priority, application Sweden, Jul. 12, 1976, 7607925
Int. Cl.[2] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **9 Claims**



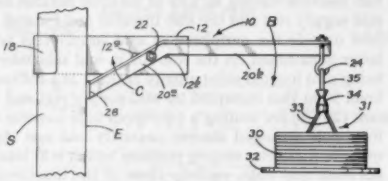
3. A locking device for seat belts intended for vehicles of the type in which a strap, being a part of the seat belt, is automatically drawn into and wound up on a rotatable coiling shaft when the seat belt is not used, to temporarily lock said shaft, the locking device comprising a ratchet means rigidly attached to said shaft; a locking means fixedly mounted in relation to said shaft, said locking means being positioned adjacent said ratchet means outside its path of rotation; at least one pocket in said locking means, each said pocket having a wall inclining towards said ratchet means obliquely in the direction of rotation of said ratchet means during withdrawal of belt; at least one cylindrical locking body accommodated in each said pocket, each said locking body being arranged for displacement along said wall from a neutral position to a locking position in which said locking body engages with said ratchet means for preventing rotation of said shaft; a rotatably mounted guiding means provided with a guiding surface for said locking body; means for coupling said guiding means to said shaft at the beginning of the locking operation for turning said guiding means with said shaft from a neutral position for moving said locking body to its locking position; and means for returning said guiding means to its neutral position, when the tension in the strap ceases, for returning said locking body to its neutral position.

4,167,255

ELECTRICIAN STUD GRIP

Laurence B. Benson, 836 E. Washington, Burns, Oreg. 97720

Filed Nov. 1, 1976, Ser. No. 737,204
Int. Cl.[2] E04G *3/00*; B65H *49/00*
U.S. Cl. 242—129 **6 Claims**



1. A stud grip for removable mounting on a rectilinear building stud and for holding a load comprising:

a single bracket member formed as an elongate plate having a coplanar surface and an end formed with a bend dimensioned to extend around a peripheral portion of the stud so the coplanar surface contacts the stud and a remainder portion of said bracket member extends outwardly from the stud; and

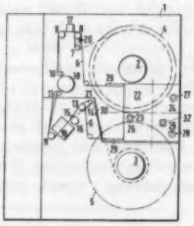
a pivot arm pivotally connected intermediate its ends to said remainder portion for holding the load, said pivot arm being operable for selective swinging alongside said coplanar surface between a stud engaged position and a disengaged position, said stud engaged position being defined by one of said ends of said pivot arm extending diagonally downward toward the stud with said end of the pivot arm contacting the stud to thereby clamp a surface portion of the bend in a flush manner against the stud, said clamping being effected by load weight on the other said end of said pivot arm, and said disengaged position being defined by said pivot arm noncontacting the stud so that said bend is released from being clamped to thereby permit removal of said bracket member laterally from the stud.

4,167,256

TAPE RECORDER/REPRODUCER FOR SELECTABLY OPERATING IN REEL-TO-REEL AND CASSETTE MODES

Heinrich Zahn, Rossdorf, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 6, 1977, Ser. No. 839,801
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1976, 2645421
Int. Cl.[2] G11B *23/10*
U.S. Cl. 242—194 **4 Claims**



1. Apparatus for recording and/or reproducing television signals respectively on and from a tape record medium having recording and/or reproducing transducers and a tape drive mechanism for transporting a tape record medium past said transducers and also comprising:

reel-to-reel tape payout means, including a tape supply reel and a hub for mounting the same, for causing the tape

record medium to be paid out from said tape supply reel as required by said tape drive mechanism;

reel-to-reel take-up means, including a take-up reel and a hub for mounting the same, for causing the tape record medium to be taken up from said tape drive mechanism onto said take-up reel, said take-up reel when mounted on said hub therefor having an axis of rotation parallel to that of said supply reel and the hub therefor and located so as to pass outside the periphery of said supply reel when the latter is mounted on the hub for it, and said take-up reel being also located substantially entirely at a different axial level from that occupied by said supply reel and

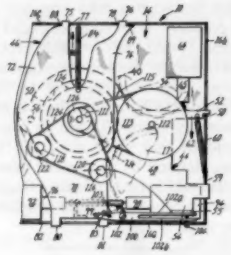
means (23–28) for seating a two-spool tape cassette that has its spools arranged therein coaxially and one above the other in a cassette seating position which is at least in part between said hubs, entirely clear of the locations of said hubs, and faces the cassette in a direction suitable for extracting a portion of the tape thereof for application of said tape drive thereto.

4,167,257

TAPE DECK CAPSTAN SHIFTING APPARATUS

Glenn E. Clarridge, Portland, Oreg., assignor to Ford Industries, Inc., Portland, Oreg.

Filed Apr. 21, 1978, Ser. No. 898,911
Int. Cl.[2] G03B *1/04*
U.S. Cl. 242—201 **7 Claims**



1. Tape drive apparatus comprising

tape transport means for supporting tape for reversible movement,

first drive means mounted for movement into and out of a position of driving engagement relative to said transport means, operable, when in said position, to drive a supported tape in one direction and at one speed,

second drive means mounted for movement relative to said transport means and to said first drive means, selectively toward one driving engagement position for driving a supported tape in said one direction at a speed different from said one speed, and toward another driving engagement position for driving such tape in the opposite direction, and

coupling means operatively interposed between said first and second drive means adapted to produce movement of the former out of a position of driving engagement relative to said transport means with movement of the latter toward such a position, said coupling means including an arm operatively connected to one of said two drive means through means defining a double cam surface.

4,167,258

AFT CARGO DOOR FOR AIRCRAFT

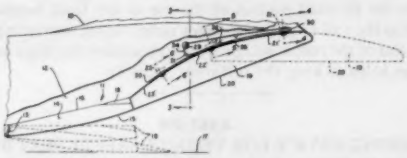
Arthur J. Robertson, Marietta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Mar. 24, 1978, Ser. No. 889,971
Int. Cl.[2] B64C *1/14*
U.S. Cl. 244—129.5 **8 Claims**

1. In an aircraft having a nacelle with an internal pressurized hold for cargo and an access opening to said pressurized hold in the aft end portion of said nacelle for on-and-off loading of cargo, a two segment door associated with said opening for completely closing said opening comprising:

a forward door segment pivotally connected to the nacelle at the forward end of said opening for movement to and from a first position overlying and closing the forward portion of said opening and at least one second position extending outwardly of said nacelle and uncovering said opening;

an aft, one piece door segment carrying tracks slidably mounted on a plurality of center and outboard pylons carried by the nacelle for movement in an arcuate path along the aft portion of said opening to and from a first extreme position overlying and closing the aft portion of said opening and a second extreme position uncovering said opening and extending longitudinally downstream and outside of the fixed structure of said nacelle, the adja-



cent ends of said forward and aft door segments being unconnected one from the other at all times and adapted to abut end to end when disposed in their said first positions to thereby define and maintain said pressurized hold unobstructed, said forward and aft door segments each being defined by external surfaces which form a smooth and aerodynamically clean continuation of each other and of the adjacent nacelle surface when located in their said first positions;

a seal carried by said nacelle and defining said opening and a complemental surface carried by each of said forward and aft door segments for engagement with said seal when said segments are located in their said first positions; and

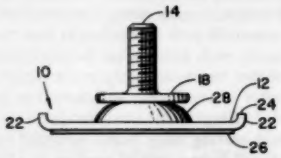
a releasable lock operative to secure said segments against substantially all movement relative to each other and to the nacelle when said segments are each in their said first positions.

4,167,259

ADHESIVE FASTENING DEVICE

George J. Bury, Lake Villa, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Sep. 29, 1977, Ser. No. 838,039
Int. Cl.[2] A47B *96/06*
U.S. Cl. 248—205 A **4 Claims**



1. An adhesive fastening device for securing a secondary workpiece to a primary work surface through the use of a U-shaped induction core to induce heat in the device, the device including a plate-like base of ferromagnetic material having a substantially uniform, predetermined cross-sectional thickness, the periphery of the plate including a pair of parallel side edges, said parallel edges being upturned, presenting marginal flanges extending in planes perpendicular to the plane of the top surface of the plate the topmost surface of the flanges

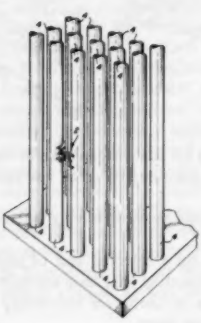
having a width substantially equal to the thickness of the plate and said top surface of the flanges being located in a plane parallel to the plane of the top surface of the plate spaced from the top surface of the plate a distance not substantially greater than the predetermined thickness of the base, the bottommost surface of the plate being coated with a layer of heat activable adhesive adapted to fixedly secure the fastening device to the primary work surface upon application of heat to said adhesive by the generation of flux in the base by the U-shaped core when the end surfaces of the core are positioned to abut the upper surfaces of the flange, means integral with said plate-like base for the securement of a secondary workpiece to said fastening device and therefore to said primary work surface wherein the minimum width of the upper flange surface in conjunction with the minimum spacing of the upper flange surface from the top surface reduces the heat loss in the vicinity of the parallel side edges while permitting the flux path to be efficiently transferred through the plate and provide sufficient space between the core and the adhesive layer.

4,167,260

BRACKET MEANS FOR MOUNTING TEST FIXTURES ON BOILER TUBES

Christopher Hahin, 2409 Carrelton Dr., Champaign, Ill. 61820

Filed Apr. 13, 1978, Ser. No. 895,881
Int. Cl.² F16M *13/00*
U.S. Cl. 248—225.3 A **3 Claims**



1. Bracket means for attaching an oxidation test fixture or the like between a pair of parallel boiler tubes, comprising:

(a) a support member adapted for arrangement normal to, extending across and adjacent the outer peripheries of the boiler tubes;

(b) a pair of jaw members adapted for arrangment between and adjacent the opposed peripheral surfaces of the boiler tubes, respectively, the remote faces of said jaw members each having a configuration to conform generally with the adjacent outer peripheral surface of the associated tube;

(c) means connecting said jaw members for longitudinal displacement relative to said support member, said connecting means including a bolt connected with one of said jaw and support members and extending through a longitudinal slot contained in the other of said members; and

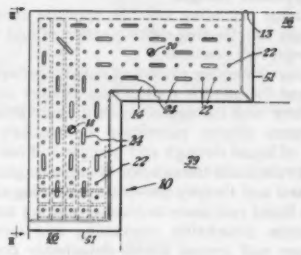
(d) screw thread means connected between said jaw members for simultaneously displacing said jaw members in opposite directions longitudinally of said support member, whereby said screw thread means are operable to separate said jaw members into tight engagement with the tubes and thereby rigidly mount said support member on the tubes.

4,167,261

WINDOW SHADE, CURTAIN, OR DRAPERY ROD CORNER BRACKET

Bernard E. Bartels, 4230 Canal #9 Rd., West Palm Beach, Fla. 33406

Filed Apr. 17, 1978, Ser. No. 889,555
Int. Cl.² A47H *1/10*
U.S. Cl. 248—270 **4 Claims**



1. A ribbed, self-positioning corner bracket eliminating measuring during mounting for use in mounting a window covering upon a mounting bracket, comprising:

a substantially planar inverted L-shaped mounting plate adapted to be secured on a surface near a corner of a window opening;

at least one laterally extending flange generally perpendicular to said mounting plate attached to an edge of said mounting plate for locating said mounting plate in the corner of said window opening precluding measuring of said mounting bracket; and

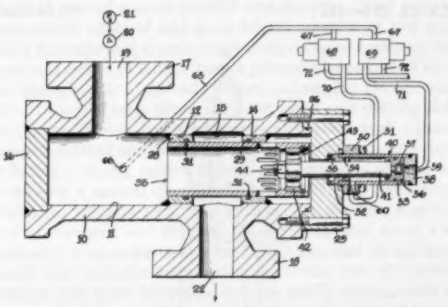
a plurality of preformed holes and adjusting slots in vertical and horizontal arrays in said mounting plate for receiving and locating a mounting bracket for a window covering.

4,167,262

PILOT ACTUATED VALVE

John C. Lemmon, Salem, Ohio, assignor to Hunt Valve Co., Inc., Salem, Ohio

Filed Oct. 12, 1976, Ser. No. 731,291
Int. Cl.² F16K *31/122*
U.S. Cl. 251—25 **12 Claims**



1. A valve for controlling flow of liquid under pressure, comprising:

a valve body, having a longitudinal opening which is closed at both ends,

inlet and outlet ports communicating with said body opening at longitudinally spaced places therealong,

a valve plunger slidably received within said body opening and reciprocable axially thereof, said plunger being in the form of a tubular cylinder which is open at both ends and is of substantially uniform interior diameter along its entire

length to provide a unobstructed opening therethrough, one open end of said valve plunger being related to said inlet port so that liquid from the latter is in constant communication with the interior of said valve plunger,

a pair of seals disposed in said body opening and extending between said body and the exterior surface of said plunger, said seals being spaced apart and disposed on opposite sides of said outlet port thereby to prevent fluid flow from said inlet port to said outlet port except through said cylinder plunger,

an operator extending into the opposite open end of said plunger for effecting shifting action of said valve plunger between two positions,

an apertured member extending radially between said operator and the interior wall of said plunger connecting said operator with the opposite end of said valve plunger, the apertures therein permitting substantially unrestricted flow of liquid through said plunger and out said opposite end to surround the exterior of said plunger at said opposite end and thereby provide a balancing effect to minimize liquid resistance to plunger shifting action,

first means detachably connecting said member to said plunger and second means detachably connecting said member to said operator to facilitate ready assembly and disassembly thereof,

said plunger having radial ports in its defining wall, said radial ports cooperating with one of said seals, whereby in one position of said plunger communication between said inlet and outlet ports in blocked, and in the other plunger position communication between said inlet and outlet ports is effected.

11. The construction according to claim **10** wherein said first means comprises the inner surface of said valve plunger having an annular transversely disposed shoulder inwardly of said opposite end, one side face of said plate ring seating against said shoulder, and a snap ring seated in an annular groove in the said inner surface of said valve plunger and bearing against the opposite side face of said plate ring to lock the latter to said valve plunger.

4,167,263

BUTTERFLY VALVE

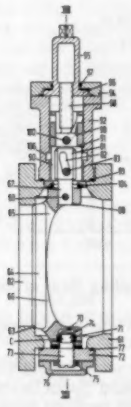
Douwe J. Cupedo, Rotterdam, Netherlands, assignor to Cupedo's Octroolmaatschappij B.V., Rotterdam, Netherlands

Filed Oct. 31, 1977, Ser. No. 847,020

Claims priority, application Netherlands, Nov. 1, 1976, 7612097

Int. Cl.[2] **F16K** *25/00*

U.S. Cl. 251—161 **14 Claims**



1. In a butterfly valve comprising a body, a valve seat in the body, a valve member, an operating rod for the valve member and control means to control movements of the operating rod, the improvement wherein the assembly of valve member and operating rod has a pivot point in the body; wherein the control means are adapted to pivot this assembly about the pivot point from the closed valve position to lift the valve member before it is rotated to open the valve; wherein on the operating rod is formed a head having a slanting slot with respect to the plane of the valve member; and wherein through said slot a first cross-pin extends, the ends of which extend into vertical grooves in the inner wall of an upper, hollow-cylindrical body portion, said cross-pin being at the bottom of the slot when the valve is closed and being disposed to be moved upwardly through the vertical grooves and the slot, the assembly of the operating rod and the valve member pivoting about the pivot point to lift the valve member as a result of the inclined position of the slot.

4,167,264

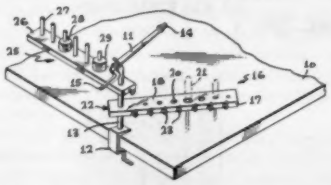
VISE CADDY TOOL RACK

James P. Kretzmeir, 2236 MacFarlane Dr., Woodland Hills, Calif. 91364

Filed Jul. 17, 1978, Ser. No. 925,035

Int. Cl.[2] **B25B** *5/16*

U.S. Cl. 269—16 **4 Claims**



1. A tool caddy for use with an upright vise having a vertical rod supporting a cantilevered set of vise jaws, the combination comprising:

an elongated base member having opposite sides and opposite ends;

means carried on a selected end of said base member for releasably mounting said base member on said vise vertical rod so as to cantilever outwardly therefrom beneath said set of vise jaws;

means carried on said base member for removably receiving and carrying a variety of work tools and work materials;

said releasable mounting means includes a hole provided in the edge marginal region of said selected base member end adapted to slidably receive said vise rod;

a manually operated screw threadably carried on said selected base member end engagable with said vise rod to clamp said base member to said vise rod in a desired position with respect to said set of vise jaws;

said work tool carrying and receiving means includes a plurality of upright posts carried on said base member in fixed spaced apart relationship along the central longitudinal plane of said base member in row;

each of said posts having a free end exposed to receive said work tools and said work material;

said work carrying and receiving means includes a plurality of holes of different diameters provided in said base member between said opposite ends in fixed spaced apart relationships adapted to insertably receive selected tools;

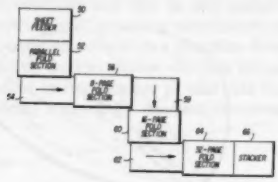
said base member further includes a plurality of hooks outwardly projecting from one side of said base member; and

releasable means operably carried on each of said hooks for holding its associated hook in place on said base member.

4,167,265
FOLDING MACHINE AND CONTROL

John S. Whittenberger, Sidney, Ohio, assignor to Graphics Equipment International Corporation, Chicago, Ill.

Continuation of Ser. No. 734,564, Oct. 21, 1976, abandoned.
This application Apr. 6, 1978, Ser. No. 893,842
Int. Cl.[2] B65H *45/14*
U.S. Cl. 270—68 A 5 Claims



1. A sheet folding machine comprising a plurality of fold sections, and further comprising:

an electric power supply;

a separate DC motor associated with each of said fold sections;

a master SCR control circuit between said power supply and one of said DC motors, said master SCR control including a master rheostat for varying the average DC power applied to said one of said DC motors;

at least one slave SCR control circuit between said power supply and at least a second of said DC motors, said slave SCR control circuit including at least one SCR-type element for controlling the DC power applied to said second of said DC motors, said SCR control circuit further including a relaxation oscillator having a timing circuit comprising a slave rheostat and a capacitor for determining a pulse period of said relaxation oscillator, said relaxation oscillator providing output pulses to said at least one SCR-type element for controlling the firing angle of said at least one SCR-type element to thereby control the average DC power applied to said second of said DC motors;

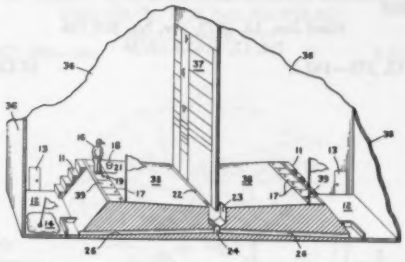
connection means connecting said slave SCR control circuit to said master SCR control circuit, said connection means providing a voltage indication signal to said timing circuit of said slave SCR control circuit indicative of the power applied to said one of said DC motors to thereby control the spacing of pulses emanating from said relaxation oscillator to affect the firing angle of said at least one SCR-type element and thereby vary the average DC power applied to said second of said DC motors.

4,167,266
INDOOR GOLF DRIVING RANGE

Benjamin Tabicman, 630 Rugsley Ave., Bronx, N.Y. 10473, and Howard Rapp, 70 Ash St., Englewood Cliffs, N.J. 07632

Filed Jul. 8, 1977, Ser. No. 813,832
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—35 B 6 Claims

1. An indoor golf driving course comprising a flexible building maintained in erected condition by air pressure retained therein, a backstop extended from the floor to ceiling and positioned toward the center of said building, a driving range extending from each side of said backstop toward the corresponding end of said building, a tee area located near each said corresponding end; said backstop being marked on both sides in accordance with the distance from said tee area to show correct loft of a golf ball hit by a given club at said tee area; and

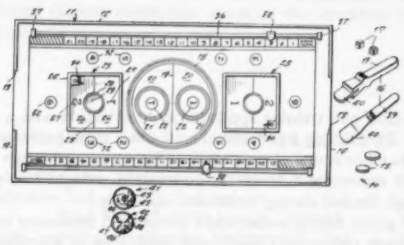


means to return to a given point said balls that were driven from said tee area toward said backstop.

4,167,267
PUCK PROJECTING GAME

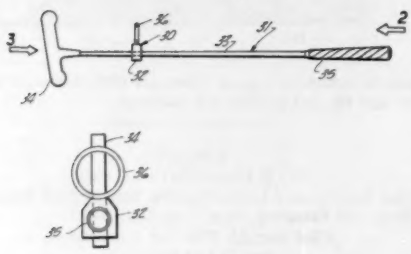
Anibal Romero, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Dec. 22, 1975, Ser. No. 642,684
Int. Cl.[2] A63B *67/12*
U.S. Cl. 273—95 E 1 Claim



1. In a puck projecting game the combination of a game board, a plurality of pucks for movement upon said game board, a plurality of shooters for flipping said pucks upon said game board, a pair of conventional dice for determining a start of said game between players, wherein said game board includes a pair of spaced parallel scorekeepers along opposite longitudinal edges of said game board, a center of said game board between said scorekeepers comprising of a playing field upon said center of which there is printed a large kickoff circle containing a pair of spaced symmetrical smaller circles, and a pair of score frames being mounted upon said playing field, said score frames being symmetrically positioned adjacent opposite sides of said printed large circle, each said score frame including a raised, square shaped wall around a central area containing a central circular walled central cup defending a goal area, wherein each said scorekeeper includes a printed row of numbers, and an indicator arrow slidable along a bar supported at opposite ends upon blocks mounted on said game board, said indicator arrow pointing to said row of numbers, wherein said score frames centers are axially aligned with the center of said kick-off circle wherein a plurality of kickoff positions additional to said kick-off circle are imprinted on said playing field around each said score frame, each said kick-off position being printed with a different number, wherein each said puck comprises a circular disc, and each said shooter includes a thin resilient blade projecting centrally from one end of a thicker stiff handle, wherein the puck includes movable means for causing erractic flight pattern whereby said means changes the center of gravity of said puck haphazardly during flight and the said means is a member pivoted about the puck center.

4,167,268
GOLF PUTT TRAINING APPARATUS
Walter R. Lorang, 2239 W. Maple Rd., Walled Lake, Mich. 48088
Filed Jun. 13, 1977, Ser. No. 805,716
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—163 A 10 Claims



10. Golf putt training apparatus in combination with a golf putter for teaching a golfer to align the face of his putter angularly in a horizontal plane normal to his envisioned target line and to move the face of his putter in a straight line path through the ball during his stroke, including

said putter having a shaft and a putter head connected to the lower end of said shaft, said head lying in a horizontal plane outwardly from said shaft, said head having a putting face lying in a substantially vertical plane, said shaft leading upwardly from said head angling toward the golfer on an inclination to the vertical.

a gauge comprising mounting means and sighting means;

said mounting means attaching said sighting means on the shaft of a putter spaced above the head of the putter;

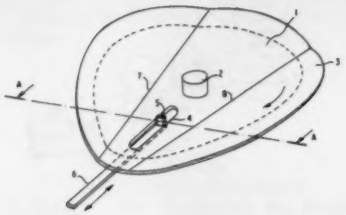
said sighting means comprising dual spaced distinct visual indicating members extending from said mounting means in a plane above the head of the putter in a direction away from the golfer in superposed visually similarly spaced relationship on either side of the putting face of the putter and in the line of sight from the golfer's eye to the putter;

said visual indicating members being in proper initial alignment with the putter for putting when said visual indicating members and the putter visually appear in equally spaced relationship over their mutual visual extent therebetween;

a golfer both at his stance and during his stroke sighting on the putter past said indicating members sees said indicating members in proper initial alignment with the putter both when the putter lies normal to his envisioned target line at stance and during his strcke when the path of his stroke is on a straight line and the putter face normal thereto;

a golfer both at his stance and during his stroke sighting on the putter past said indicating members sees said indicating members out of proper initial similarly spaced alignment with the putter when the putter does not lie normal to his envisioned target line and/or during his stroke when the path of his stroke is not on a straight line.

4,167,269
FLEXIBLE RECORD DISK SIGNAL STORAGE APPARATUS
Michael R. Hatchett, Romsey, and Leonard J. Rigbey, Winchester, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 775,233, Mar. 7, 1977, abandoned. This application Oct. 31, 1977, Ser. No. 847,376
Claims priority, application United Kingdom, Sep. 30, 1976, 405/76
Int. Cl.[2] G11B *3/60*
U.S. Cl. 274—39 A 31 Claims



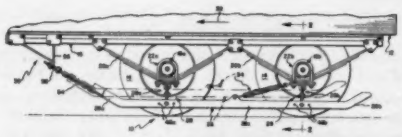
1. A flexible record disk type signal storage apparatus including in combination:

a backing member having a flat web portion in a first axial plane and other portions abutting said web portion disposed in planes on opposite sides of and in other than said axial plane such that a generally concave surface faces a first direction,

a flexible signal record disk mounted in juxtaposition to said concave facing surface for rotation thereover about an axis of rotation and in a path conforming to said backing member, and

transducing means located in juxtaposition to said web portion and adapted for radial motions for transducing operations with respect to said signal record disk.

4,167,270
RECREATIONAL VEHICLE SKID SUPPORT
Paul LaPlaca, 11574 Porterville Rd., East Aurora, N.Y. 14052
Filed Dec. 30, 1977, Ser. No. 865,850
Int. Cl.[2] B62B *13/18*
U.S. Cl. 280—8 8 Claims



1. In a skid support for a recreational vehicle of the type having a pair of skid assemblies suspended one below each side of said vehicle in order to prevent overturning or excessive swerving of said vehicle in the event of blowout of a vehicle tire, the improvement wherein each of said skid assemblies comprises in combination:

an elongated skid;

support means for suspending said skid beneath said vehicle in an operative position while permitting retracting movements of said skid from said operative position alternatively in directions extending forwardlyupwardly and rearwardly/upwardly relative thereto, said skid when said operative position being aligned with the direction of travel of said vehicle and spaced from engagement with said road surface when the tires of said vehicle adjacent to which said skid is disposed are properly inflated and for engagement with said road surface when said tires are

deflated, said support means including at least one support assembly having bracket means, upper hinge means for connecting said bracket means for movement relative to said vehicle about a first axis and lower hinge means for connecting said skid for movement relative to said bracket means about a second axis, said first and second axes being parallel and extending horizontally in a direction transversely of said direction of travel;

restraining means for preventing said retracting movements of said skid from said operative position in a direction rearwardly/upwardly relative thereto; and

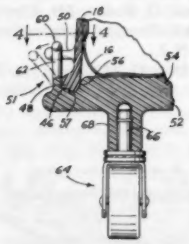
resilient means cooperating with said restraining means for normally maintaining said skid in said operable position while permitting said retracting movements of said skid from said operative position in a direction forwardly/upwardly relative thereto against the bias of said resilient means incident to engagement of said skid by a ground obstacle during rearwardly directed movement of said vehicle.

4,167,271

TRASH BAG HOLDER

Anker E. Jorgensen, 12140 NW. Marshall, Portland, Oreg. 97229

Filed May 1, 1978, Ser. No. 901,431
Int. Cl.[2] B62B *1/10*; B65D *25/16, 7/04*
U.S. Cl. 280—79.1 R **2 Claims**



1. A trash bag holder comprising:

a side support member defining a substantially continuous tubular wall for extending about and supporting the sides of a bag, said support member having upper and lower openings defined therein,

a rounded rim formed on said support member, adjacent said lower opening,

a molded bottom member including edge surface means integrally formed therein and positioned to engage edge and interior surface portions of said support member adjacent said lower opening to inhibit lateral shifting of said side support member relative to said bottom member, said means defining a shoulder having an annular outwardly facing surface and an annular upwardly facing surface for engaging said surface portions, and

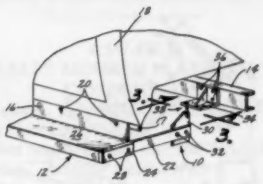
a plurality of yieldable spring members mounted on said bottom member adjacent but spaced radially outwardly from said edge surface means, said spring members comprising fastening means for yieldably engaging and disengaging portions of said rim when said support member is forcibly moved onto and away from said bottom member, respectively, engagement of said spring members with the rim portions serving to releasably secure said surface portions between said spring members and said edge surface means.

4,167,272

MOUNTING STRUCTURE FOR A RUNNING BOARD

Harold G. Wright, and Ronald D. Silbaugh, both of Scranton, Iowa, assignors to Scranton Manufacturing, Scranton, Iowa

Filed Jul. 26, 1978, Ser. No. 928,267
Int. Cl.[2] B62B *9/16*
U.S. Cl. 280—163 **8 Claims**



1. A mounting structure for attaching a running board to a vehicle having a cap and a frame moveable independent of each other, said mounting structure comprising:

means for attaching said running board to said cab;

a mounting bracket attached to said running board and extending inwardly thereof toward to said frame; and

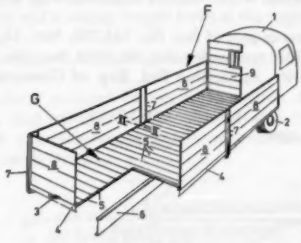
a universal coupling connecting said mounting bracket to said frame, said coupling permitting a swing of limited angle in any direction, whereby the running board is allowed to move with the cab and independent of the frame thereby minimizing stress on the mounting structure.

4,167,273

LOAD CARRYING PLATFORM OR BACK FOR VEHICLES

Heinrich Hrasche, Dietikon, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Nov. 10, 1977, Ser. No. 850,155
Claims priority, application Switzerland, Dec. 8, 1976, 15459/76
Int. Cl.[2] B60P *7/00*
U.S. Cl. 280—179 R **31 Claims**



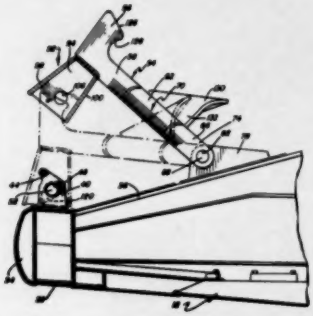
1. Load carrying platforms or backs of vehicles, in particular such platforms made out of light metal elements, including a platform surface and a platform frame therearound, with at least one ring-shaped holding device which is hinged to said frame and is for attaching ropes or the like clamping facilities for securing loads in place on said platform surface, in which said frame is provided with at least one groove-shaped recess which has a diameter and narrower opening, into which a bearing part of the hinged holding device, pivotable about the long axis of the recess, fits or from which it can be removed, said holding device being pivotable from an operative position adjacent said platform surface to a resting position adjacent said platform frame.

4,167,274

SCRAPER PULL-HOOK ASSEMBLY

Jack H. Trittipoe, Elwood, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 7, 1977, Ser. No. 804,421
Int. Cl.[2] B60D *1/04*
U.S. Cl. 280—481 **12 Claims**



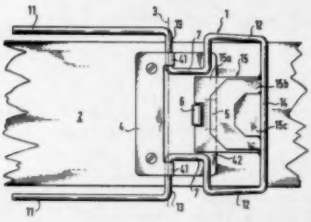
5. In a tractor scraper having a push frame and a hitch assembly carried by said push frame, in combination, a pair of spaced apart, upstanding brackets carried by said push frame, a hitch having one end portion with an upper side and a lower side, said hitch having a forwardly facing hook on said upper side and a mounting member on said lower side, said mounting member being detachably secured to said brackets, said hitch having a pair of legs diverging outwardly from said one end portion, means for pivotally securing said legs to said push frame at points spaced from said upstanding brackets whereby a bale on a following vehicle can engage with said hook, said push frame having a top surface, said upstanding brackets are mounted on said top surface of said push frame and have rearwardly curved upper portions for preventing a bulldozer blade from riding up the top of said push frame.

4,167,275

SKI BRAKE

Klaus Weiss, Leonberg, and Heinz Luithlen, Rutesheim, both of Fed. Rep. of Germany, assignors to Vereinigte Baubeschlagfabriken Gietsch & Co. GmbH, Leonberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 744,780, Nov. 14, 1976, abandoned. This application Jan. 30, 1978, Ser. No. 873,125
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1975, 2554110
Int. Cl.[2] A63C *7/10*
U.S. Cl. 280—605 **15 Claims**



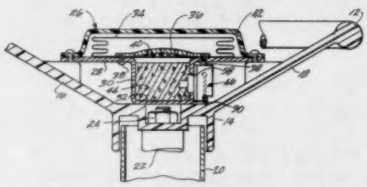
1. Ski brake comprising a bail rotatably mounted about a fixed transverse axis on a ski, said bail having two brake arms extending alongside the ski on the one side of said axis and a pedal on the other side of said axis, a distinct deploying means fastened at one end to said pedal at a point remote from said axis, a supporting surface on top of the ski, said deploying means extending with another end thereof to said supporting surface in every rotational position of said bail and being movable along said supporting surface, said deploying means being on the same side of said axis as the pedal and being resiliently biased relative to said pedal such that in the absence of a ski boot on said pedal said deploying means is adapted to move along said supporting surface and rotate said bail into a braking position wherein said brake arms project below the bottom of the ski and the pedal projects above the top of the ski, said bail being rotated against the bias of said deploying means by a ski boot being placed on said pedal into an inactive position wherein said brake arms are located in the plane of or above said ski and the pedal lies beneath the ski boot affixed in a ski binding, said deploying means being formed by at least one flexural spring, which, when said bail is in said braking position extends to a point on said supporting surface which is on the same side of said axis as said pedal, and friction reducing means comprising a distinct member having a curved surface supported on said flexural spring at said other end for contact of its curved surface with said supporting surface.

4,167,276

SELF-CONTAINED AIR BAG SYSTEM

Lon E. Bell, Altadena; Brian K. Hamilton; William R. Dickie, both of Canyon County, all of Calif.; Robert M. Wulbrecht, Utica, and Donald G. Radke, Mt. Clemens, both of Mich., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Dec. 17, 1976, Ser. No. 751,858
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—731 **14 Claims**



1. An integral, modular, self-contained safety apparatus for a vehicle comprising:

a mounting member for attaching said apparatus to a support inside said vehicle;

said apparatus comprising:

a container secured to said mounting member;

an inflatable safety restraint disposed in said container;

an inflating means connected to said inflatable restraint for supplying a gas to inflate said restraint;

a sensor disposed adjacent to said mounting member responsive to a predetermined level of deceleration of said vehicle;

a pyrotechnic primer disposed adjacent to said mounting member for actuating said inflating means;

means for firing said pyrotechnic primer in response to said sensor responding to said predetermined level of deceleration; and

interlock means engaging said support when said mounting means attaches said apparatus to said support for automatically placing said sensor in a condition for actuation when said mounting member attaches said apparatus to said support.

4,167,277

SNAP-IN RETRACTOR

Robert J. Rumpf, Grosse Pointe, Mich., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 31, 1977, Ser. No. 801,474
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—807 8 Claims

1. An installation structure for automobile accessory assemblies such as retractors for safety belt webbing comprising:

a mounting element holding an accessory assembly;

pivot means provided in one side of said mounting element;

a stop means provided in the other side of said mounting element;

an accessory pocket defined by structural automobile parts and having one edge in pivot relation with said pivot means and having another edge in engagement with said stop means upon pivoting said frame on said pivot means and said one edge whereby said pivot means is first engaged at said one edge and said mounting element is then pivoted on said one edge to engagement of said stop means against said another edge of said accessory pocket; and

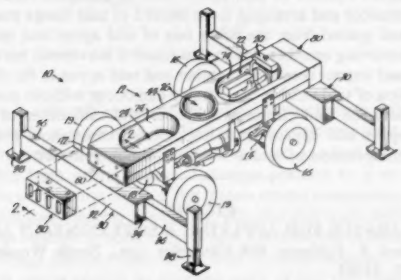
resilient latch means secured to said mounting element adjacent said stop means and opening upon tilting said mounting element into said pocket by engagement with said another edge and closing behind said another edge at engagement of said stop means with the front of said another edge.

4,167,278

MAIN FRAME CONSTRUCTION FOR VEHICLES

Terry M. Holmes, Schofield, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 8, 1977, Ser. No. 858,743
Int. Cl.[2] B62D *21/00*
U.S. Cl. 280—786 10 Claims



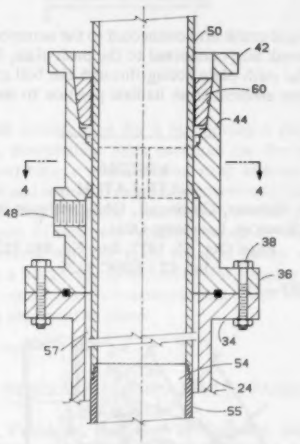
1. A main frame construction for a vehicle including first and second vertically spaced, generally horizontal, elongated plates each having spaced opposite lateral edges and opposite ends, said plates having a plurality of vertically aligned pairs of openings intermediate said opposite lateral edges and opposite ends, reinforcing means extending between and permanently connected to said plates, said reinforcing means including a rigid reinforcing plate extending between said plates and in extended engagement with adjacent surfaces of said elongated plates in close proximity to peripheral edges of each pair of vertically aligned openings, at least one pair of openings and adjacent reinforcing plate creating a space adapted to receive a drive component, and members respectively interconnecting said opposite lateral edges and opposite ends of said plates to produce a generally hollow frame construction for a vehicle.

4,167,279

VERTICALLY MOORED PLATFORM DECK CASINGHEAD

James E. Lucksinger, Carbondale, Colo., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sep. 18, 1978, Ser. No. 943,402
Int. Cl.[2] E21B *19/10*
U.S. Cl. 285—144 3 Claims



1. An apparatus for connecting the upper end of a casing string extending from a subsea well to a floating vessel supporting an upright member which comprises:

a casing torque hanger means having a cylindrical torque resistant spool having at least a vertical slot on the interior thereof and a casing hanger bowl at the upper end of said spool;

means to support said casing hanger means from said upright member;

a casinghead mandrel having a lug mating with said slot when said mandrel is inserted into said casing hanger means and including means to connect said mandrel to said casing string.

4,167,280

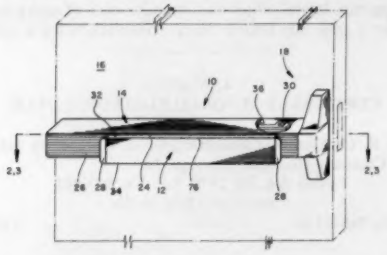
PANIC EXIT MECHANISM

Max Godec, and Stephen G. Branson, both of Indianapolis, Ind., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jul. 24, 1978, Ser. No. 927,101
Int. Cl.[2] E05C *3/16*
U.S. Cl. 292—92 10 Claims

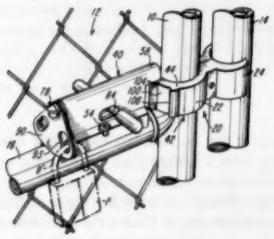
1. A panic exit latch and actuator assembly comprising a housing, a latch bolt actuator movable between a projected position and a retracted position, an actuator element, means supporting the actuator element for movement between a first position and a second position, first means providing an operative connection between the actuator element and the latch bolt to move the latch bolt toward its retracted position in response to movement of the actuator element from its first position to its second position, a push plate supported for movement outwardly and inwardly relative to the housing,

second means providing an operative connection between the push plate and the actuator element to move the actuator element from its first position to its second position in response to movement of the push plate inwardly, the second means including a bell crank pivotally mounted in the housing and



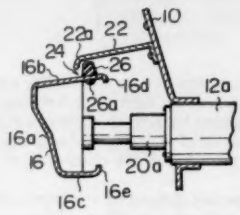
including one crank arm connected to the actuator element and another crank arm connected to the push plate, inward movement of the push plate acting through the bell crank to move the actuator element from its first position to its second position.

4,167,281
GATE LATCH
Donald B. Spencer, Cincinnati, Ohio, assignor to The Mason Fence Company, Leesburg, Ohio
Filed Oct. 13, 1977, Ser. No. 841,812
Int. Cl.[2] E05C *3/26*
U.S. Cl. 292—216 **20 Claims**



1. A retractable latch for the latch-catch of a gate, said latch comprising a bolt housing, a bolt mounted within said housing for endwise axial movement between fully advanced and retracted positions, means yieldably urging said bolt to a fully advanced position, a hasp connected to said housing and having a central opening defined therein through which a rear end of said bolt passes when said bolt is in said fully retracted position and a pair of through-openings defined therein; and a pendulum stop pivotally attached to said housing in covering relationship with said hasp so that said hasp is interposed between said pendulum stop and said housing, said pendulum stop having an abutment area adapted to be positioned adjacent said hasp central opening for contacting said bolt rear end and preventing movement of said bolt into said retracted position; said pendulum stop having a pair of elongate openings defined therein adjacent said abutment area, each of said elongate openings being positioned for disposition into alignment with said hasp central opening by pivotal movement of said pendulum stop so that said bolt rear end can pass through said aligned central and elongate openings to permit movement of said bolt into said fully retracted position, and pendulum stop being pivotally connected to said housing to assume a position with said abutment area aligned with said hasp central opening under the influence of gravity to be in an interfering relationship with said bolt unless moved to align one of said elongate openings with said hasp central opening thereby preventing the unintentional or accidental retraction of the bolt from a fully advanced position; said hasp through openings each being aligned with one of said pendulum stop elongate openings to receive a locking means when said pendulum stop is in said interfering relationship so that said latch bolt can be locked in said fully advanced position.

4,167,282
IMPACT ABSORBING TYPE BUMPER
Mitsunobu Matsuyama, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Japan
Filed Aug. 8, 1977, Ser. No. 822,941
Claims priority, application Japan, Aug. 10, 1976, 51-107504[U]
Int. Cl.[2] B60R *19/06*
U.S. Cl. 293—102 **13 Claims**



1. An impact absorbing type bumper in combination with a vehicle body frame, comprising:

an impact receiving member located a distance from the end of the vehicle body frame, said impact receiving member being securely attached to at least one shock absorber mounted to the vehicle body frame, said impact receiving member comprising a central beam section and two side sections, said central beam section having a channel-like cross section and having a front portion, an upper portion and a lower portion, said upper portion and said lower portion extending toward the vehicle body frame from said front portion to form said channel-like cross section;

an apron in the form of a rigid plate having one end attached to the vehicle body, said apron bridging a space between said impact receiving member and the end of the vehicle body, said apron having a flange portion at the other end thereof which extends toward said impact receiving member to juxtapose said impact receiving member; and

an elastomeric spacer disposed between and mounted to one of said apron and said impact receiving member to prevent direct contact of said apron with said impact receiving member and arranged to be inward of said flange portion and spaced from the other one of said apron and impact receiving member and so that relative movement between said impact receiving member and said apron in the direction of said vehicle body frame can occur without contact between said elastomeric spacer and said other of said apron and impact receiving member throughout the full compression of said at least one shock absorber.

4,167,283
APPARATUS FOR APPLYING A SOFT CONTACT LENS
Michael A. Feldman, 864 Glenridge Ave., North Woodmere, N.Y. 11581
Continuation-in-part of Ser. No. 818,400, Jul. 25, 1977, abandoned. This application Apr. 3, 1978, Ser. No. 892,930
Int. Cl.[2] A61F *9/00*
U.S. Cl. 294—1 CA **12 Claims**

1. A contact lens inserter for soft contact lenses for applying said soft contact lens to the surface of an eye comprising:

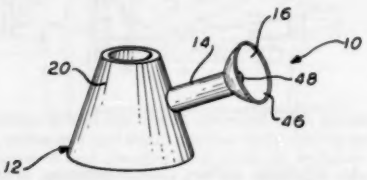
a finger receiving means comprising a flexible material having a tapered wall construction for snugly receiving a

means for attachment thereto of an article to be mailed and displayed and for attachment thereto of one side of a second of said panels adapted to be folded over said one side of said first panel, thereby enclosing said article within said panels and forming a letter envelope;

said second panel forming a front cover of said device and having therein an integral window portion defined by perforations extending through said second panel, such fingertip therein so that the fingertip controls the movement of said inserter,

a lens support member comprising a generally concave cup for holding said lens,

an opening formed in said lens support member to preclude creation of suction therein which would tend to hold said contact lens in said lens support member,



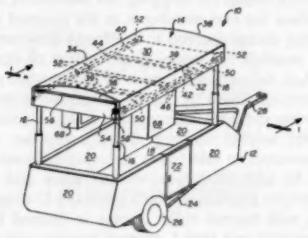
and a stem member connecting said lens support member to said finger receiving means, said stem member extending substantially orthogonally with respect to the ball of the finger and substantally laterally with respect to the axis of the finger, so that said lens support member approaches the eye in the same direction as the ball of the finger approaches the eye.

4,167,284

COLLAPSIBLE CAMPERS

Roland Messina, 122-05 111th Ave. S., Ozone Park, N.Y. 11420

Filed Apr. 13, 1978, Ser. No. 895,910
Int. Cl.[2] B60P *3/32*
U.S. Cl. 296—171 **11 Claims**



1. In a collapsible camper including a base having a floor, wall panels, a rigid roof member capable of being raised and lowered relative to the base, and at least one bed member movable from a first retracted storage position to a second withdrawn position for use, the improvement comprising:

a rigid roof member having top, side and end walls defining therewithin in both of its raised and lowered positions a storage compartment for at least one bed member;

guide means carried by opposed walls of said roof member for guiding and retaining said at least one bed member in said compartment;

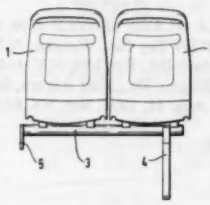
and at least one bed member dimensioned for positioning within said storage compartment, including means thereon cooperable with said guide means to permit substantially horizontal guided movement of the bed member for storage within said compartment and for withdrawal of the bed member therefrom.

4,167,285

SIDEWALL STRUCTURE OF A BUS WITH SEATS MOUNTED ON THE WALL

Hans Fenner, Evilard; Wilhelm Auwarter, Gumlingen, and Karl-Heinz Stark, Muttenz, all of Switzerland, assignors to Ramseier & Jenzer AG, Carosseriewerke Bern, Bern, Switzerland

Filed Oct. 3, 1977, Ser. No. 838,986
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715548
Int. Cl.[2] B62D *27/00*
U.S. Cl. 296—178 **9 Claims**



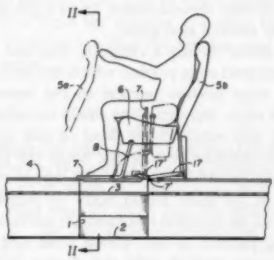
1. A sidewall construction for a bus having a plurality of fitted sections, comprising: seats mounted on the wall and having a support tube; a seat fastening strap attached to said support tube of said seats and extending downward, one of said sections comprising a bottom arch section at the level of a lower end region of said seat fastening strap and having an angle-shaped recess with an open rim and facing said seat fastening strap; a hanger bar in said recess for hanging said seat fastening strap; and screw lock means in said recess for disconnectably fixing said seats in place.

4,167,286

ENTRANCE STRUCTURE FOR A MULTI-PASSENGER VEHICLE

Ludwig Geyer, Puchheim, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nuernberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 887,889
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714912
Int. Cl.[2] B60J *9/02, 7/22*
U.S. Cl. 296—178 **9 Claims**



1. An entrance structure for a multi-passenger vehicle comprising a passenger compartment including floor means and a longitudinal axis, a stairwell leading into said passenger compartment, seat means arranged adjacent to the stairwell and in said passenger compartment and oriented so that a passenger's legs would be located above the stairwell, plate means adapted to cover said stairwell, said plate means being adapted to form part of said floor means, hinge means operatively securing said plate means to said floor means adjacent to said seat means, said hinge means having a hinging axis extending substantially across to said longitudinal vehicle axis, whereby said plate

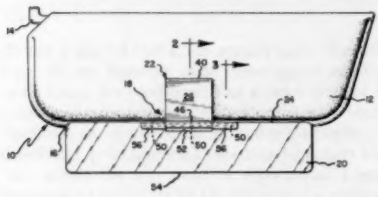
means are tiltable upwardly toward said seat means for opening said stairwell for its intended use, and whereby a passenger sitting on said seat means may rest his feet on top of said plate means when the latter is in the stairwell closing position.

4,167,287

ROTATABLE GLARE SHIELD FOR VEHICLES

Jim M. Franklin, 1237 Bay Rd., Webster, N.Y. 14580; Gary J. Reed, 160 Wheelock Rd., Penfield, N.Y. 14526, and John Van Sickle, 1841 Billington Rd., East Aurora, N.Y. 14052

Filed Aug. 11, 1977, Ser. No. 823,647
Int. Cl.[2] B10J *3/00*
U.S. Cl. 296—97 C **1 Claim**



1. In combination with a vehicle sun visor having an opaque body disposed in downward position so as to present a substantially horizontal lower edge portion,

a glare shield comprising a body of transparent glare reducing material having a horizontal upper marginal edge portion, and

a single clip device pivotally connecting said glare shield to the lower edge portion of the visor for movement between an upwardly swung stored position and a downwardly swung position in which the glare shield depends from said lower edge portion of the visor, said clip device being resilient and comprising a pair of opposed arms straddling said body of the visor from below and having upper free end portions engaging and frictionally gripping the body of the sun visor therebetween, and a bight portion joining the lower ends of said arms,

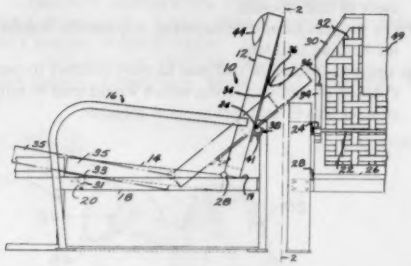
said glare shield having a centrally disposed notch in said upper marginal edge portion which defines a downwardly stepped edge portion parallel to but below said upper marginal edge, and said glare shield including a hinge pin bridging said notch at the level of said upper marginal edge, the opposite ends of the hinge pin projecting into and being embedded within said upper marginal edge portion of the glare shield body on either side of said notch with an exposed intermediate portion of said hinge pin lying parallel to but spaced from said downwardly stepped edge portion, said clip device including a wall extending transversely of one of said arms on the outer side thereof adjacent the juncture of said bight portion therewith and defining a channel in conjunction with said outer side of the one arm which is of a width less than the thickness of said hinge pin, said exposed intermediate portion of the hinge pin being snap-fitted and retained in said channel and said bight portion being of a width substantially the same as the length of said exposed intermediate portion of the hinge pin and extending therebelow a sufficient distance to extend below said downwardly stepped edge portion.

4,167,288

TV CHAIR WITH DOUBLE PILLOW CASE AND TWO-STEP OTTOMAN

Piao Kiang, 146, Hsin-I Road, III, Taipei, Taiwan, Taiwan

Continuation-in-part of Ser. No. 671,946, Mar. 30, 1976, Pat. No. 4,078,841. This application Feb. 3, 1978, Ser. No. 874,932
Int. Cl.[2] A47C *1/02*
U.S. Cl. 297—378 **3 Claims**



1. An adjustable recliner chair comprising: a rigid frame structure; a seat member having a bottom and a back portion, movable between an upright position and an inclined position, said back portion being foldable over onto said bottom portion; means mounting the bottom portion to the back portion along adjacent edges thereof for relative pivotal movement therebetween; first roller and track means adapted to support the bottom portion on the frame structure at a forward portion thereof for substantially horizontal translational movement of the bottom portion relative to the frame structure; second roller and track means adapted to support the back portion on the frame structure for movement from an upright position to a reclining position; third roller and track means having a roller mounted on each side of the seat member substantially coincident with the mounting means and a substantially horizontal track mounted on the frame structure upon which the third rollers are supported for movement therealong; first limiting means secured to the bottom portion at the rear end of the first track means for stopping the movement of the bottom portion when the seat member is in the inclined position; second limiting means secured to the frame structure at a predetermined position for stopping movement of the third roller means when the seat member is in the upright position; said second limiting means including a retaining means for releasably retaining the third roller means against the second limiting means, said second limiting means comprises an L-shaped bracket mounted to said frame structure adjacent the position occupied by said third roller means when said seat is in its desired upright position so that a generally U-shaped cavity for receiving said second roller means is formed between said frame structure and said L-shaped bracket and wherein said retaining means is located within the generally U-shaped cavity and comprises a leaf spring having a bent end portion engageable with the roller means.

4,167,289

METHOD AND SYSTEM FOR CONTROLLING EARTH PRESSURE IN TUNNEL BORING OR SHIELD MACHINE

Kozo Ono, and Masao Suda, both of Tsuchiura, Japan, assignors to Hitachi Construction Machinery Co., Ltd., Japan

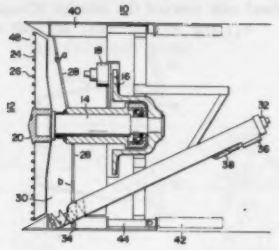
Filed Sep. 29, 1977, Ser. No. 837,801
Int. Cl.[2] E21D *9/04*
U.S. Cl. 299—1 **26 Claims**

1. In a tunnel boring or shield machine of the earth-pressure control type including a chamber defined between a working face and a bulkhead provided in a machine frame of a shield machine body, means for controlling the amount of earth or muck conveyed from said chamber to the exterior of the ma-

chine, and drive means for propelling the shield machine body toward and into the working face, a method for controlling the earth pressure and comprising the steps of:

detecting the earth pressure in said chamber;

comparing the detected earth pressure in said chamber with a reference value thereby generating a signal representing the earth pressure deviation in said chamber; and



controlling at least one of said conveyed earth amount control means and said shield machine body driving means in response to said chamber earth pressure deviation signal so as to change at least one of the amount of earth conveyed and the amount of earth removed by advancing said shield machine body thereby maintaining the earth pressure in said chamber within a predetermined range to prevent breakdown of the exposed face and rising of the ground.

4,167,290

SHIELD TYPE HYDRAULIC TUNNEL BORING MACHINE

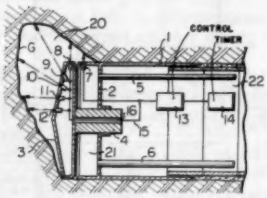
Hironobu Yamazaki, Kashiwa; Eiji Sugino, Tokyo, and Yoshiaki Yuchida, Koshigaya, all of Japan, assignors to Tekken Construction Co. Ltd., Tokyo, Japan

Filed Oct. 4, 1977, Ser. No. 839,278

Claims priority, application Japan, Mar. 11, 1977, 52-26047

Int. Cl.[2] E21D *9/04, 9/12*

U.S. Cl. 299—1 **7 Claims**



1. A shield type tunnel boring machine comprising a substantially cylindrical shield body having adjacent an axial end a bulkhead, a rotary cutter head centrally supported by said bulkhead for cutting and boring opposing tunnel face ground, means provided at least in said cutter head for transmitting high frequency oscillations towards the tunnel face ground wall and for receiving oscillations reflected from said ground wall wherein a plurality of said oscillation transmitting and receiving means are provided at least along a radial line on the outer surface of said rotary cutter head facing the tunnel face ground and spaced from one another, said plurality of oscillation transmitting and receiving means including ones for transmitting the oscillations from positions adjacent the periphery of the cutter head in diagonally outward directions with respect to an axial line of said shield body and ones for emitting the oscillations from positions adjacent the center of the cutter head in parallel directions to said axial line, and means connected to said oscillation transmitting and receiving means for determining the oscillation transmitting and receiving time interval.

4,167,291

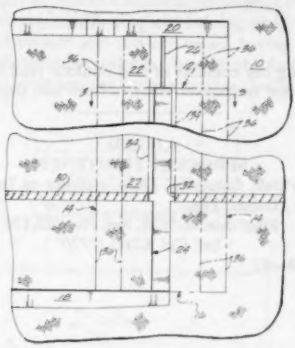
METHOD OF FORMING AN IN SITU OIL SHALE RETORT WITH VOID VOLUME AS FUNCTION OF KEROGEN CONTENT OF FORMATION WITHIN RETORT SITE

Richard D. Ridley, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Dec. 29, 1977, Ser. No. 865,704

Int. Cl.[2] E21B *41/10*

U.S. Cl. 299—2 **13 Claims**



4. In a method for forming an in situ oil shale retort in a subterranean formation containing oil shale, wherein formation within a retort site in such formation is explosively expanded to form an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, such formation including a generally horizontally extending stratum of formation having a higher kerogen content than the average kerogen content of formation in the retort site, the improvement comprising the steps of excavating a void which extends vertically through the stratum of higher kerogen content, excavating formation so that the horizontal cross section of the void in proximity to the stratum of higher kerogen content is greater than the average horizontal cross section of the vertical void, and thereafter explosively expanding formation toward such void so that fragmented mass containing particles from the stratum of higher kerogen content has a higher void fraction than the average void fraction of the fragmented mass.

4,167,292

METHOD OF USING A LOW TEMPERATURE FREEZING SOFTENING AND ABRASION FLUID

Saul A. Eller, 17-41 166th St., Whitestone, N.Y. 11357

Filed Nov. 22, 1977, Ser. No. 853,839

Int. Cl.[2] E21C *37/06, 41/10*

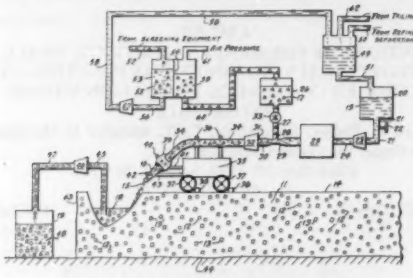
U.S. Cl. 299—7 **8 Claims**

1. A method for use in abrading and recovering bitumen (heavy oil) particles from a bitumen containing deposit which is on the surface and hence exposed to outdoor temperatures and in which said bitumen particles are encased by sand particles, stone or other foreign matter; said method comprising:

a. spraying a low temperature freezing fluid onto the exposed surface, thereby abrading away particles of said deposit, said bitumen, said sand, said stone and said foreign matter by the scouring, abrasive action of the fluid on the deposit;

b. washing said particles of deposit, bitumen, sand, stone and

foreign matter by said fluid into an outdoor pool, the contents of which are exposed to outdoor temperatures;



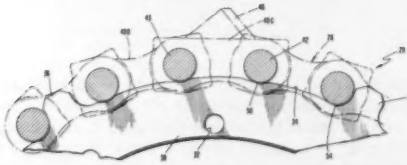
c. pumping the contents of said outdoor pool to separation equipment to recover bitumen from said deposit.

4,167,293

SPROCKET TIGHTENER

Larry A. O'Dell, Columbus, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 6, 1978, Ser. No. 913,170
Int. Cl.[2] E21C *25/10*
U.S. Cl. 299—82 **8 Claims**



1. In a machine for cutting earth formations, of the type comprising a vehicle body, and a power driven rotary cutter mounted on said body, said cutter including wheel means and a cutter chain mounted in circular fashion around said wheel means, said cutter chain comprising a plurality of links connected together by transverse pins, and cutter-receiving sockets carried by said links, the improvement wherein said wheel means comprises a peripheral surface for supporting said pins, and a plurality of circumferentially spaced recesses in said surface, the quantity and spacing of said recesses corresponding to the quantity and spacing of said transverse pins in said chain such that said pins can be positioned in said recesses, said recesses being of sufficient depth to support said chain in a slackened condition when said pins are positioned in said recesses, and the diameter formed by nonrecessed portions of said surface being large enough to prevent said pins from traveling completely out of said recesses during earth cutting operations in which said pins travel outwardly upon the sides of said recesses to tighten the chain.

4,167,294

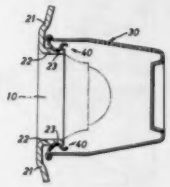
APPARATUS FOR MOUNTING A HUB CAP TO A WHEEL

Hiroshi Okazaki, Kariya; Toshio Suzuki, Okazaki; Takeo Kondo, and Nobuo Hiraiwa, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Continuation of Ser. No. 705,887, Jul. 16, 1976, abandoned. This application Feb. 14, 1978, Ser. No. 877,668
Claims priority, application Japan, Aug. 7, 1975, 50-109367
Int. Cl.[2] B60B *27/00*
U.S. Cl. 301—108 R **4 Claims**

1. A combination of a cup shaped ornamental hub cap and an apparatus for mounting said hub cap onto a cylindrical flange protruding from the central portion of a wheel body to conceal the outer end of a wheel axle, the hub cap having an open end, a closed end, and sides extending from said closed end and terminating at said open end, the apparatus comprising:

a resilient clip ring having an annular shaped dish spring portion clamped to said open end of said hub cap, said dish spring portion being extended radially inwardly and tiltable at the clamped portion thereof in an axial direction of said wheel axle toward the interior of said hub cap, said



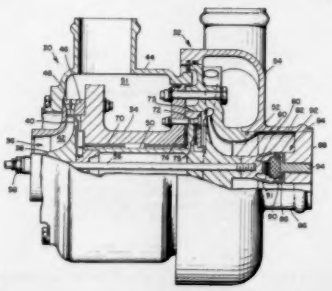
dish spring portion having a plurality of spring legs extending radially inwardly from the inner peripheral edge of said dish spring portion towards said closed end of said hub cap which are adapted to engage with an annular recess on said cylindrical flange, said spring legs being resiliently engageable with said annular recess due to tilting movement of said dish spring portion toward the interior of said hub cap to hold said hub cap to said wheel body when engaged therewith.

4,167,295

MAGNETIC THRUST FORCE RELIEF FOR A FOIL BEARING TURBOMACHINE

Jerry Glaser, Playa del Rey, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 8, 1977, Ser. No. 858,869
Int. Cl.[2] F16C *17/10, 32/04, 39/06*
U.S. Cl. 308—9 **10 Claims**



1. A turbomachine comprising:

a housing;

a rotatable wheel mounted on a shaft and disposed within said housing;

bearing means to rotatably support said rotatable wheel within said housing, said bearing means including a foil thrust bearing to axially restrain said rotatable wheel; and

magnetic means operably associated with said housing and said rotatable wheel to reduce the static friction on the foil thrust bearing of said bearing means,

said magnetic means comprising a ferromagnetic generally flared cup-shaped nut threaded to one end of the rotatable wheel shaft, said generally flared cup-shaped nut including a generally cylindrical recessed pad disposed therein,

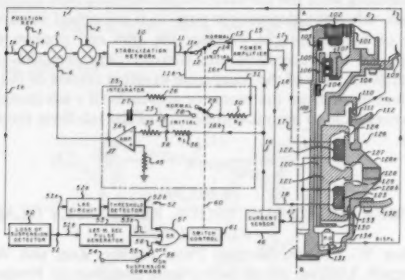
and a permanent magnet means mounted within said housing in juxtaposition to said ferromagnetic end nut.

4,167,296

PROTECTIVE CONTROL SYSTEM FOR MAGNETIC SUSPENSION AND MAGNETICALLY SUSPENDED DEVICES

Joe B. Dendy, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,117
Int. Cl.[2] F16C *39/00*
U.S. Cl. 308—10 **9 Claims**



1. In a magnetic suspension apparatus of the type in which a suspended member is in inherently unstable equilibrium along one of its suspension axes, said apparatus including spaced mechanical stop means for limiting the maximum displacement of said suspended member along said axis and a servo loop for normally stabilizing said suspended member along said axis including electromagnetic actuator means for normally positioning said suspended member apart from said stop means, said servo loop including:

first means for supplying a signal varying in accordance with the position of said suspended member from said normal position along said axis,

said signal having a maximum value when said suspended member is at one of said stop means,

second means responsive to said signal for normally controlling said electromagnetic actuator means to maintain said signal substantially at zero magnitude, thereby normally maintaining said suspended member in said normal position, and

third means for placing said servo loop in said initial state prior to normal suspension operation comprising:

integrator means having an output coupled with said position signal, and

switch means responsive to said position signal in said initial state for placing said integrator means in said initial state so as to supply said integrator output in a polarity opposing said position signal and of a magnitude to reduce substantially said maximum value thereof, and in said normal condition, to supply said position signal of reduced value to said second means.

4,167,297

MOUNTING ASSEMBLY FOR A JOURNAL BEARING

William D. Cheesman, Houston, Tex., assignor to Royce Equipment Company, Houston, Tex.

Filed Feb. 22, 1978, Ser. No. 880,113
Int. Cl.[2] F16C *33/30*
U.S. Cl. 308—187 **12 Claims**

1. Mounting assembly for a journal bearing that is adapted to be disposed between a rotating headshaft and a frame member, comprising:

a bearing cone of a substantially cylindrical configuration having:

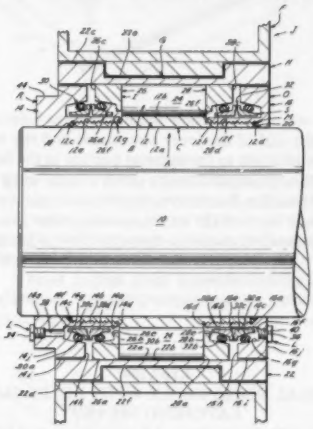
an inner cone surface to be disposed about the rotating headshaft and having an inside diameter corresponding substantially to the outside diameter of the rotating headshaft;

an outer annular bearing surface having a diameter greater than said inner cone surface;

first and second radial end portions at each end of said bearing cone; and,

first and second outer annular threaded surfaces each being of a diameter greater than said inner cone surface, said first outer annular threaded surface formed between said first radial end portion and said outer annular bearing surface, and said second outer annular threaded surface formed between said second radial end portion and said outer annular bearing surface;

first and second outside seal retainer means each having an inner annular surface of a diameter substantially the same as said inner cone surface of said bearing cone, said first and second outside seal retainer means having first and second inner threaded surfaces, respectively, formed adjacent to said inner annular surface for threadedly engaging



said first and second outer annular threaded surfaces, respectively, of said bearing cone, said first and second outside seal retainer means each having an inclined compressing surface formed between said inner annular surface and said inner threaded surface, respectively;

first and second resilient compression means for mounting on the headshaft between said first and second radial end portions and said inclined compressing surfaces of said first and second outside seal retainer means, respectively, for compressible engagement of said first and second resilient compression means with the headshaft upon axial threaded movement of said inner threaded surfaces of said first and second outside seal retainer means and said first and second outer annular threaded surfaces of said bearing cone, respectively, said first and second resilient compression means frictionally engaging the headshaft upon compression thereof between said first and second outside seal retainer means and said first and second radial end portions of said bearing cone, respectively, for locating said bearing cone axially along the headshaft, as desired.

4,167,298

BALANCED CABINET DOOR LIFT

Robert F. Plattner, Spring Lake, Mich., assignor to Bastian Blessing Company, Inc., Phoenix, Ariz.

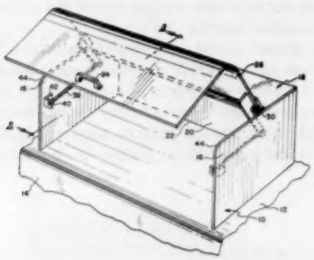
Filed Jan. 18, 1978, Ser. No. 870,445
Int. Cl.[2] A47B *88/00*; B65D *43/24*
U.S. Cl. 312—319 **3 Claims**

1. A self service display cabinet having a rectangular body

including means defining an access opening extending through one vertical side and a part of the top wall adjacent thereto,

a transparent L-shaped closure unit for the opening pivotally mounted proximate to the edge of the opening on the top wall for opening and closing movement about a horizontal axis,

elongated lever arm means rigidly carried by the closure unit and extending horizontally under the remaining portion of the top wall and disposed normal to, but below, the level of said axis when said unit is closed,



resilient means comprising tension springs interconnecting the inner end of the lever arm means and the sides of the cabinet adjacent to the opening portion in the front wall at a position proximate to the level of said inner end in its closed position but above the level of said inner end to resiliently support the cover as a unit when the cover is in an intermediate partially open position, wherein said top wall rigidly supports the sides and back wall, and the bottom of the cabinet is open, and

manual means on said closure unit for manually actuating said closure unit.

4,167,299

ELECTRICAL RECEPTACLE WITH RELEASABLE TAB LATCHING MEANS

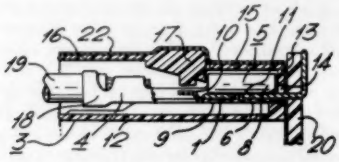
Masaro Noguchi, Sagamihara, Japan, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 6, 1978, Ser. No. 922,263

Claims priority, application United Kingdom, Jul. 7, 1977, 28455/77

Int. Cl.[2] H01R *13/42, 13/62*

U.S. Cl. 339—59 R **3 Claims**



1. An electrical connector comprising an electrical tab receptacle formed from sheet metal and comprising a generally channel shaped receptacle portion having a base and upstanding side walls with free edge portions of the side walls turned in over the base for receiving a complementary electrical tab between the base and the turned in edge portions of the side walls, there being an integral tongue struck from the base and extending from the base at the forward, tab entry end of the receptacle portion, the tongue extending rearwardly within the receptacle portion, a free end portion of the tongue at the rearward end of the receptacle portion being bent to project away from the base, and the tongue being formed within the receptacle portion with a lance inclined rearwardly towards the turned in edge portions of the side walls, the lance being adapted and arranged to engage in a recess or aperture in a tab when mated with the receptacle for latching the tab against withdrawal from the receptacle, the connector also comprising a housing of electrically insulating material in which the receptacle is secured, the housing having a bottom wall on which the base of the receptacle rests, a front wall which is engaged by the forward end of the receptacle to prevent withdrawal of the receptacle from the housing with the forward end of the receptacle leading, the front wall being formed with a hole to admit a tab for mating with the receptacle in the housing, and an upper wall formed with a resiliently depressible portion having an inwardly directed projection which engages behind the rear ends of the turned in edge portions of the side walls of the receptacle to prevent withdrawal of the receptacle from the housing with the forward end of the receptacle trailing and which, when the depressible portion is depressed towards the base of the receptacle, engages the free end portion of the tongue of the receptacle and thereby depresses the tongue towards the base of the receptacle to effect release of the lance on the tongue from the recess or apertures of a tab mated with the receptacle to permit withdrawal of the tab from the receptacle.

4,167,300

MEASURING ELECTRODE, ESPECIALLY GLASS ELECTRODE

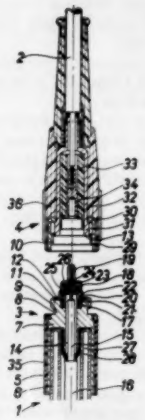
Walter W. Fischer, Morges; Peter Jucker, Zug, and Werner Ingold, Uitikon, all of Switzerland, assignors to Proton AG, Zug, Switzerland

Filed Jan. 10, 1977, Ser. No. 758,139

Claims priority, application Switzerland, Jan. 14, 1976, 406/76

Int. Cl.[2] H01R *13/00*

U.S. Cl. 339—94 C **24 Claims**



1. A cable connection system for a measuring electrode for detachably connecting a body of the measuring electrode with a connection cable, comprising:

a part arranged at the body which is constructed as a plug portion;

said plug portion comprising an inner plug and a substantially coaxially arranged outer plug separated from one another by an insulating body having an end face;

said outer plug being axially rearwardly set back from the end face of the insulating body;

said connection device further comprising a bushing portion having an insulating body;

said insulating body of the bushing portion engaging in a substantially cap-like manner over a free part of the insulating body of the plug portion

said free part of said insulating body of the plug portion provides a relatively large insulation path separating the

inner plug and the coaxially arranged outer plug, which large path counteracts the formation of short-circuit bridges both by arcing and by possible vapor condensate deposition thereat; and

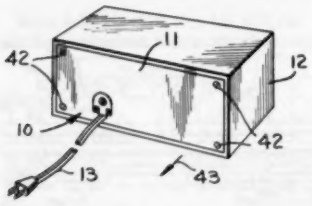
said free part of said insulating body includes a free edge between an end surface thereof and an outer peripheral portion thereof which free edge promotes tear-off of any condensate film formed thereat when said plug portion is engaged with said bushing portion.

4,167,301

POWER CORD STRAIN RELIEF

Glenn R. Mundschenk, Utica, N.Y., assignor to General Electric Company, New York, N.Y.

Filed Aug. 24, 1978, Ser. No. 936,208
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—105 **10 Claims**



1. Strain relief apparatus, supported by a wall of a housing, for selectively permitting relative motion between a cord extending into the housing and the wall, comprising:

a member having a cavity extending towards the inside of the housing from the outside of the wall and a first slot in communication with the cavity and the inside of the housing;

a post supported in the cavity;

a movable cover for the cavity; and

means for securing the cover to the member from the outside of the wall, the secured cover cooperating with the member to define a second slot;

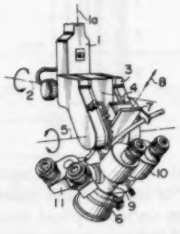
whereby, with the cover secured, if the cord extends through the first slot, around the post and through the second slot, the cord will be anchored to the wall with the apparatus and, with the cavity uncovered, the cord can be moved with respect to the wall through the first slot.

4,167,302

SURGICAL MICROSCOPES WITH L-SHAPED MOUNTING BRACKETS

Yukinori Karasawa, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Japan

Filed Aug. 23, 1977, Ser. No. 827,078
Claims priority, application Japan, Aug. 25, 1976, 51-113771[U]
Int. Cl.[2] G02B *21/22, 23/18*
U.S. Cl. 350—36 **5 Claims**



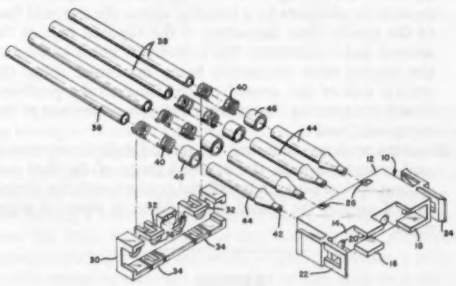
1. A surgical microscope comprising a support member mounted on a frame for lateral swinging movement about a first axis and a vertical swinging movement about a second axis, said support member being movable along a third axis which is parallel with neither of said first and second axes, objective lens tube means having a longitudinal axis and carrying at least a pair of objective lens systems, binocular tubes removably mounted on said objective lens tube means and including at least two pairs of eye lenses, each corresponding to said pair of objective lens systems, means for mounting said objective lens tube means on said support member in at least two alternative positions between which said objective lens tube means is rotated about its longitudinal axis by a predetermined angle, said mounting means including a generally L-shaped mounting bracket having first and second legs which are alternatively attached to the objective lens tube, means on said first and second legs for alternately attaching said legs to said support member.

4,167,303

LIGHT TRANSMITTING FIBER CABLE CONNECTOR

Terry P. Bowen, Etters; Charles D. Hoover, Harrisburg; Gilbert D. Ferdon, Hummelstown, and Robert G. Harwood, Mechanicsburg, all of Pa., assignors to AMP Incorporated, Harriburg, Pa.

Filed Jul. 28, 1977, Ser. No. 819,919
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.21 **9 Claims**



1. An improved connector assembly for joining light transmitting fiber cables to transmitter and/or receiver devices and/or like cables, each said connector assembly including:

a housing member having a plurality of profiled passageways extending therethrough from a cable receiving end to a mating face,

a cap member detachably received on the cable receiving end of said housing to secure cables therein,

a ferrule member secured on the end of each said cable, each said ferrule member having a profiled front end, at least one rearwardly directed radial shoulder, and a bore through which at least one fiber of said cable passes,

a helical spring member mounted on each said cable to rest against said shoulder of said ferrule member, each said cable being inserted in a respective aperture of said housing and secured therein by said cap compressing said spring whereby the cables are positioned in the housing with limited axial movement, and

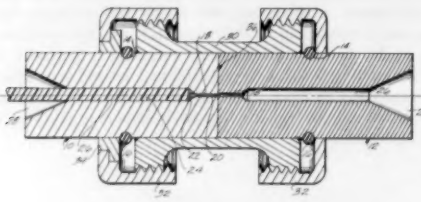
keying means extending from said mating face of said housing member.

4,167,304

METHOD AND APPARATUS FOR PROVIDING PERFECT ALIGNMENT OF OPTICAL FIBERS CONTAINED IN CONNECTORS

Arthur W. Gelbke, San Marino, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.

Filed Aug. 22, 1977, Ser. No. 826,523
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.21 19 Claims



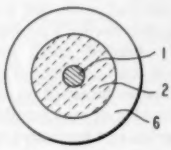
1. An optical fiber assembly comprising:
(a) a receptacle providing an internal cylindrical surface of predetermined diameter;
(b) a first cylindrical male connector providing a cylindrical outer surface and an exposed face normal to the cylindrical outer surface, and a central bore containing a first optical fiber having a central axis and an exposed face secured in said bore by a bonding agent, the exposed face of the optical fiber extending to the exposed face of said first male connector, the cylindrical outer surface of the first male connector being machined about the central axis of the first optical fiber to the predetermined diameter of the internal cylindrical surface of the receptacle;
(c) a second cylindrical male connector providing a cylindrical outer surface, an exposed face normal to the cylindrical outer surface and a central bore containing a second optical fiber having a central axis and an exposed face secured in said bore by a bonding agent, the exposed face of the optical fiber extending to the exposed face of the second male connector, the cylindrical outer surface of the second male connector being machined about the central axis of the second optical fiber to the predetermined diameter of the internal cylindrical surface of the receptacle; and
(d) means to secure said first and second male connectors in said receptacle with the exposed faces of the first and second optical fibers in interfacial contact with the central axis of each of the bound optical fibers in essential alignment.

4,167,305

OPTICAL TRANSMISSION FIBER

Terumichi Ichiba; Munetaka Kawaguchi, and Yutaka Yamamoto, all of Osaka, Japan, assignors to Sumitomo Electric Industries Ltd., Osaka, Japan

Continuation of Ser. No. 480,174, Jun. 17, 1974, abandoned. This application Feb. 15, 1978, Ser. No. 878,101
Int. Cl.[2] G02B 5/14
U.S. Cl. 350—96.34 15 Claims



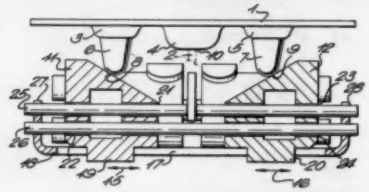
1. An optical transmission fiber comprising (1) an optical fiber which comprises a core layer having a clad layer thereover, said clad layer having a lower refractive index than said core layer, and (2) over said optical fiber at least one layer of a composition mainly comprising a thermoplastic resin selected from the group consisting of a polyamide resin, an ethylene-vinyl acetate copolymer, an ethylene-acrylic acid copolymer and an ionomer resin, wherein said thermoplastic resin has a refractive index at least equal to the refractive index of the clad of said optical fiber.

4,167,306

REAR VIEW MIRROR ASSEMBLY

Peter A. Longland, Chichester, England, assignor to Britax (Wingard) Limited, England

Filed Dec. 21, 1977, Ser. No. 863,021
Claims priority, application United Kingdom, Jan. 7, 1977, 540/77
Int. Cl.[2] G02B 5/08
U.S. Cl. 350—289 21 Claims



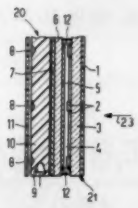
1. A remotely adjustable mirror assembly comprising reflective means; supporting means for supporting said reflective means at three points which define a triangle, said supporting means including selectively movable cam means at two of said points; solenoid means for providing a drive to adjust the position of said cam means; releasable engagement means for selectively connecting the drive of said solenoid means to said cam means; and a remote control for selectively energising said solenoid means whereby said reflective means is capable of combined elevational and azimuthal adjustment as well as separate elevational and azimuthal adjustment.

4,167,307

LIQUID CRYSTAL DISPLAY DEVICE WITH SUPPLEMENTARY LIGHTING

Werner Cirkler, Ismaning, and Hans Krüger, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 27, 1977, Ser. No. 791,519
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1976, 2619367
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—345 8 Claims



1. A liquid crystal display device comprising a liquid crystal cell having a layer of liquid crystal material switchable on a zonal basis between various optical states being interposed between a front end and rear carrier plate; a fluorescent plate disposed behind the rear carrier plate of the liquid crystal cell in a path of observation, said fluorescent plate having silvered

edge surfaces and consisting of a material having an index of refraction greater than 1 and containing fluorescent centers which are excited by an ambient light to emit a fluorescent light isotropically, said fluorescent plate being provided with light exit windows disposed behind the switchable liquid crystal zones, each of the light exit windows being a notch having surfaces, each of said surfaces being provided with a dielectric mirror which reflects on a color selection basis so that multicolored displays are obtainable; and at least one supplemental light source being embedded in the fluorescent plate to be in optical contact with the material of the plate, said source providing light for exciting the fluorescent centers.

4,167,308

ELECTROCHROMIC DISPLAY DEVICE

Donald J. Barclay, Olivers Battery; Colin L. Bird, Fair Oak, and Anthony C. Lowe, North Baddesley, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,220

Claims priority, application United Kingdom, Apr. 19, 1977, 16259/77

Int. Cl.² G02F *1/17*

U.S. Cl. 350—357 **4 Claims**

1. An electrochromic display device comprising:
a first redox system containing a first electrolyte,
a counter electrode in contact with said first electrolyte, said counter electrode containing a material that undergoes a reversible redox reaction in said first electrolyte at a known potential,
a plurality of display electrodes in contact with said first electrolyte,
a second redox system separated from said first redox system by an ion exchange membrane, and
a third electrode in said second redox system and being electrically connected to said counter electrode wherein the charge of said counter electrode is maintained at said known potential.

4,167,309

ELECTROCHROMIC DISPLAY DEVICE

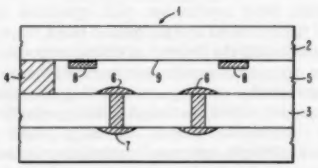
Donald J. Barclay, Olivers Battery; Colin L. Bird, Fair Oaks; Anthony C. Lowe, North Baddesley, and David H. Martin, Chandlers Ford, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,219

Claims priority, application United Kingdom, Apr. 19, 1977, 16208/77

Int. Cl.² G02F *1/17*

U.S. Cl. 350—357 **13 Claims**



1. An electrochromic display device comprising:
a hollow panel enclosing an electrolyte and having a first transparent face and a second face,
a counter electrode located on the inner surface of the said transparent face, said counter electrode containing material that undergoes a reversible redox reaction in said electrolyte at a known potential, said counter electrode being opaque and having the shape of a pattern of lines, and
a plurality of display electrodes on the inner surface of said second face.

4,167,310

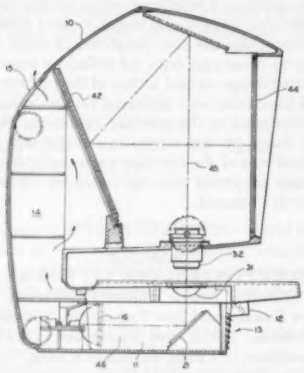
LAMP ASSEMBLY AND POWER MODULE FOR FANLESS MICROFICHE READER

Thomas J. Persha; Eino M. Lehto, both of Juneau; Richard Dueck, Hartford, and Nick Hechimovich, Horicon, all of Wis., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 16, 1977, Ser. No. 851,833

Int. Cl.² G03B *21/16, 21/28*

U.S. Cl. 353—52 **4 Claims**



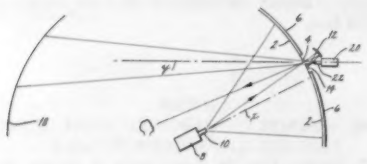
1. A microform display apparatus comprising a fanless housing having a chimney in the rear portion thereof and projection system for projecting an image from a film positioned near the front portion thereof into a viewing surface on the housing at a location which is above the film, said housing including a base having a center line extending along a longitudinal axis from the front to the back of the housing, said projection system including a lamp assembly, a mirror assembly, a power module means operatively connected to said lamp in order to provide power to illuminate said lamp, a chamber formed by said base and said housing, said chamber forming a restricted air path with respect to said housing, said chimney being a vertically rising chimney in said housing communicatingly connecting to said chamber, said lamp being mounted on a side of said base in said chamber at a point remote from said center line for projecting a beam of light at a predetermined acute angle with respect to said longitudinal axis toward said mirror assembly, said power module in said chamber on the other side of said longitudinal axis from said lamp, both said lamp and power module located on the portion of said base which is substantially under said chimney, optical means located over said mirror to direct light from said lamp assembly to the projection system of said apparatus, vent means defining an exit from said chimney, air intake means in said housing and connecting with said chamber, whereby cooling air flows through said air intake means, passes over said lamp and power module where heat is transferred to said air, and then rises in said chimney where it escapes from said housing through said vent means.

4,167,311

PROJECTION SYSTEM AND PROCESS

Marvin L. Pund, Bel Nor, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 12, 1978, Ser. No. 895,601
Int. Cl.[2] G03B *21/28, 21/56*
U.S. Cl. 353—99 **15 Claims**



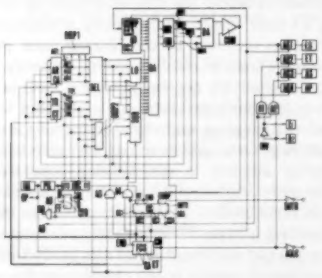
7. A projection system comprising: a first reflective surface having an aperture therein; a first projector located in front of the reflective surface and having a lens system for projecting a focused image of a scene on the reflective surface, the projector being oriented such that rays emanating from it will pass through the aperture; a reflective screen surface located behine the first reflective surrace, and means located behind the aperture for intercepting the rays projected through the aperture and for casting those rays onto the reflective screen surface to form a focused image on said screen of the portion of the scene that would have otherwise appeared on the reflective surface at the area occupied by the aperture, said means further reproducing the image on said screen as a real image which is located in space and at the aperture such that it blends into the focused image projected onto the reflective surface, whereby the aperture is obscured.

4,167,312

EXPOSURE CONTROL CIRCUIT FOR A CAMERA

Nobuhiko Shinoda, Tokyo; Nobuaki Sakurada, Yokohama; Masaharu Kawamura, Hino; Tadashi Ito, Yokohama; Hiroyashu Murakami, Tokyo, and Fumio Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 698,537, Jun. 22, 1976, abandoned.
This application Mar. 21, 1978, Ser. No. 888,622
Claims priority, application Japan, Jun. 24, 1975, 50-79016
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—23 D **8 Claims**



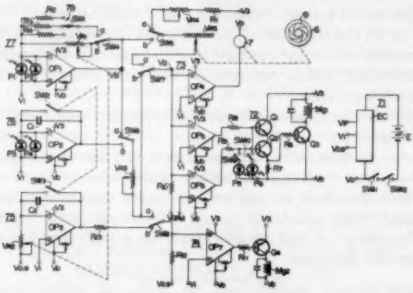
1. A control circuit for a camera, comprising: a light sensor for producing an analog output corresponding to an intensity of light, an A-D converter coupled to the light sensor for converting the analog output from the sensor into a digital value and for producing a conversion completion signal when the A-D conversion is completed, shutter release operating means for initating a shutter release operation, release signal forming means coupled to said operating means for producing a release signal in response to the operation of the operating means, an exposure control circuit coupled to the converter and responsive to the digital output for controlling an exposure on the basis of a digital output, and, an electric control circuit having a first input terminal connected to said converter and responsive to the completion signal, a second input terminal connected to said release signal forming means, a third input terminal, a first output terminal coupled to said converter, a second output terminal connected to said third input terminal, and a third output terminal for producing a third output signal for transmitting an exposure initiating signal, said electric control circuit having an initial condition when no signals are applied to said inputs in which a converter enabling signal appears at the first output terminal for initiating analog-to-digital conversion, said control circuit responding to a conversion completion signal at said first input by eliminating the enabling signal at said first output and producing a signal at said second output, said signal at said second output appearing at said third input for enabling said control circuit to transmit an exposure initiating signal at said third output terminal when a release signal appears at said second input terminal, said circuit returning to the initial condition at which a conversion initiating signal appears at the first output terminal if no release signal appears at the second input terminal while a completion signal appears at the first input terminal.

4,167,313

FOCAL PLANE SHUTTER CAMERA HAVING AN ELECTROMAGNETIC DIAPHRAGM MECHANISM

Katsuhiko Tsunefuji, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 5, 1977, Ser. No. 857,249
Claims priority, application Japan, Dec. 29, 1976, 51-160049
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—31 **8 Claims**



1. A focal plane shutter camera of the type including a focal plane shutter comprising a first blind and a second blind and in which photometry is made of light from an object being photographed which passes through a taking lens and a diaphragm and into the camera and which is reflected by at least one of the surfaces including the shutter blind and a film surface; the camera comprising a light receiving element for receiving light from an object being photographed which passes through the taking lens into the camera and which is reflected by at least one of the surfaces including the shutter blind and the film surface; a first shutter blind drive mechanism and a second shutter blind drive mechanism each operative to permit a running of the first blind and the second blind, respectively, for opening and closing the shutter; an electromagnetic diaphragm mechanism assembled into the lens barrel of the taking lens for electromagnetically opening and closing the diaphragm; a manual exposure period control circuit for permitting a manual setting of the exposure period externally of the camera; an automatic diaphragm aperture control circuit including the light receiving element for outputting a diaphragm control signal in accordance with the brightness of an object being photographed, and responsive to an output from the manual exposure period control circuit; a drive circuit responsive to an

output from the automatic diaphragm aperture control circuit for driving the electromagnetic diaphragm mechanism; a first shutter blind run control circuit responsive to an output of the automatic diaphragm aperture control circuit for operating the first blind drive mechanism; and a second shutter blind run control circuit responsive to an output of the manual exposure period control circuits for operating the second blind drive mechanism; the camera being capable of automatic photographing with a preset exposure period.

4,167,314

MOTOR DRIVE UNIT FOR A CAMERA

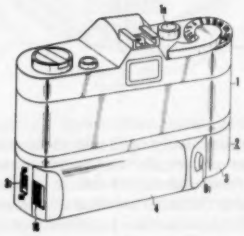
Toshikazu Ichiyanagi, Tokyo, and Tomonori Iwashita, both of Fuchu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1976, Ser. No. 726,189

Claims priority, application Japan, Oct. 1, 1975, 50/119138; Dec. 16, 1975, 50/149960; Dec. 16, 1975, 50/149961; Dec. 16, 1975, 50/149962; Dec. 16, 1975, 50/149963

Int. Cl.[2] G03B *1/00, 17/00*

U.S. Cl. 354—173 **8 Claims**



1. A motor drive unit for a camera, said camera having exposure control means with an actuator controlling actuation of said exposure control means, which unit comprises:

(a) a film winding-up member,

(b) driving means for driving said winding-up member for rotation,

(c) motion transmitting means positioned between said film winding-up member and said driving means for transmitting motion of said driving means to said film winding-up member,

(d) power supply means for said driving means, and

(e) control means for coordinating said exposure control means and said power supply means, said control means having changeover means operable with said driving means and arranged in said camera to be effective at the termination of operation of said exposure control means to actuate said power supply means, and effective at the termination of one cycle of film winding-up operation to actuate said exposure control means so long as said actuator is operated, said camera being provided with a dust-shielding cover removeably mounted in a recessed portion thereof, said motor drive unit further including means for accommodating said dust-shielding cover when it is taken out of the recessed portion of said camera.

4,167,315

APPARATUS FOR DATING CAMERA FILM

Yasuhiro Nanba, Osaka; Norio Beppu, Sennan, and Seiji Yamada, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 26, 1977, Ser. No. 819,009

Claims priority, application Japan, Aug. 3, 1976, 51-92960

Int. Cl.[2] G03B *17/24*

U.S. Cl. 354—106 **18 Claims**

1. Dating apparatus for a camera comprising:

a data source for generating date information signals;

means for displaying said date information signals to date the camera film;

decoder means connected between said data source and said displaying means for decoding said date information signals into a signal suitable for displaying; and

optical means for monitoring the display of said displaying means,

wherein said displaying means includes means for switching the amount of current flow in the displaying means between a first value for dating the camera film and a second value less than the first value for monitoring.

17. Dating apparatus for a camera, comprising:

a first power source;

chronometer means energized by said first power sources for generating electronic time signals;

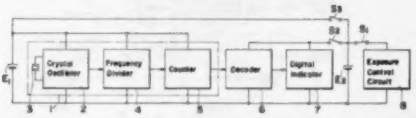
means for decoding said electronic time signals into date information signals;

means for displaying the date in accordance with said date information signals;

a second power source for energizing said displaying means to date the camera film;

means for monitoring said date information signals;

a light measuring circuit, A/D converter means responsive to the output of said light measuring circuit for generating exposure data, and logic circuit means for connecting



either the output of said A/D converter or said electronic time signals to said means for decoding whereby either exposure data or said electronic time signals are monitored by said means for monitoring or displayed on said means for displaying;

switching means for switching said electronic time signals or said exposure data to said logic circuit means;

said logic circuit means includes first and second AND gates and an OR gate interconnecting the output of said first and second AND gates to said means for decoding, said switching means including first and second switch means each including first and second positions, the first position of said first switch means interconnecting said first and second switch means in series, the second position of said first switch means providing an input to said first AND gate, said first and second positions of said second switch means providing respective inputs to said second and said first AND gates, said first AND gate having an input responsive to said electronic time signals and said second AND gate having an input responsive to said exposure data, whereby with said first and second switch means in said first positions exposure data is input to said means for decoding, and with said first and second switch means in said second positions said electronic time signals are input to said means for decoding.

4,167,316

SONAR CONTROLLED LENS FOCUS APPARATUS

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 26, 1978, Ser. No. 919,084

Int. Cl.[2] G03B *13/20*

U.S. Cl. 354—197 **27 Claims**

6. A camera having means for receiving a power supply, said camera comprising:

a manually accessible actuator;

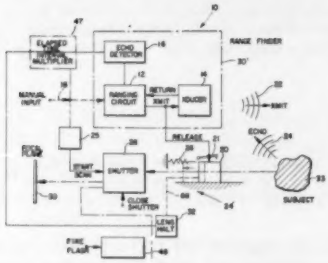
means at least in part energizable by the camera's power supply for generating and transmitting a sonar ranging

signal and for providing an indication upon detection of an echo signal reflected from a photographic subject at an elapsed time subsequent to the transmission of the sonar ranging signal;

an objective lens arrangement;

means for mounting said objective lens arrangement for displacement between a plurality of focal positions, said objective lens arrangement being adapted to focus an image of a subject located at a different distance from said camera within a given range of distances at the focal plane of said camera at each of its said focal positions; and

means responsive to the manual operation of said actuator for effecting the displacement of said objective lens arrangement so that said objective lens arrangement reaches each of its said plurality of focal positions at an elapsed time from its initial displacement directly proportionate to said elapsed time indicated upon the receipt of said echo signal by said sonar ranging means in the event that a photographic subject is located from said camera at the distance at which said objective lens arrangement would focus an image thereof at the camera's focal plane.



17. A camera having means for defining a focal plane comprising:

a shutter blade mechanism;

means for mounting said blade mechanism for displacement between at least one arrangement wherein it blocks scene light from reaching the focal plane and another arrangement wherein it defines a maximum size aperture, said blade mechanism serving to define a range of progressively increasing sized apertures for admitting scene light to the camera focal plane as it moves from its said scene light admitting arrangement;

an objective lens arrangement;

means for mounting said objective lens arrangement for displacement between a plurality of focal positions, said objective lens arrangement being adapted to form an image of a subject located at a different distance from said camera within a given range of distances at the focal plane of said camera at each of its said focal positions; and

means responsive to the displacement of said blade mounting means for displacing said objective lens arrangement between its said plurality of focal positions.

4,167,317

CAMERA SHUTTER RELEASE MECHANISM

Kunio Kawamura, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 20, 1977, Ser. No. 843,916

Claims priority, application Japan, Oct. 28, 1976, 51-130127

Int. Cl.[2] G03B *17/38*

U.S. Cl. 354—269 **11 Claims**

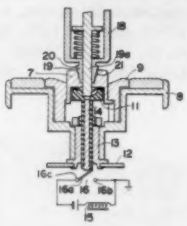
1. A shutter release mechanism for use in a camera comprising:

an electromagnetic release circuit including an interconnected electric power source, an electromagnetic means for operating a shutter release member, and a switch for energizing and de-energizing said electromagnetic means, said switch having two terminals and a movable contact member for electrically connecting and disconnecting said two terminals;

a shutter release button, to which is electrically connected one of said terminals,

an attaching portion provided in said shutter release button, said attaching portion being formed such that to it may be selectively attached either a mechanical cable release or an electric remote control release which includes a tip portion attachable to said attaching portion, a projecting portion projecting from said tip portion, and an electric switch connected between said tip portion and said projecting portion;

movable means for actuating said movable contact member by means of said shutter release button and said cable



release to selectively open and close said switch and including an electrically conductive member electrically insulated from said shutter release button and electrically connected to the other terminal of said switch and including a conductive surface positioned under said attaching portion; and

preventing means made of an insulating material, which prevents electric contact of said cable release with said electrically conductive surface when said cable release is attached to said attaching portion, said preventing means allowing the contact of said projecting portion with said electrically conductive surface, when said tip portion of said remote control release is attached to said attaching portion, so that said electromagnetic means may be energized and de-energized by means of the electric switch provided in said remote control release.

4,167,318

FILM ASSEMBLAGE OF THE SELF-DEVELOPING TYPE TOGETHER WITH APPARATUS FOR PROCESSING THEREOF

Richard R. Wareham, Marblehead, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 818,410, Jul. 25, 1977. This application Sep. 27, 1978, Ser. No. 946,206

Int. Cl.[2] G03D *9/02*

U.S. Cl. 354—298 **10 Claims**

1. Apparatus for effecting the processing of an elongated strip of self-processing film, having a pod of processing fluid and housing in a single reel type of cartridge, after its exposure in a presently commercially available camera to record a plurality of images therealong, the cartridge including a general cylindrical housing structure having an elongated light sealed opening passing therethrough and a spool having a central axle portion with a recess mounted for rotation in the housing structure about an axis extending lengthwise of the housing structure, the self-processing film strip having one end thereof connected to the spool and being coiled around the spool's central axle portion with its pod disposed in the spool's recess and with its other end extending through the housing structure's elongated light sealed opening, said apparatus including:

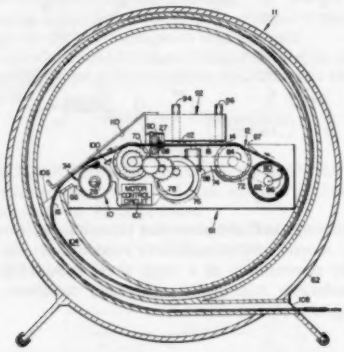
means for releasably locating the cartridge;

an elongated imbibition channel;

means, once operably connected to the film strip adjacent

the other end thereof, for progressively withdrawing the film strip from the cartridge and, after the film strip has become completely disengaged from the cartridge, for progressively advancing the film strip, other end first, into said elongated imbibition channel;

means for automatically progressively receiving and storing at least the major portion of the film strip as it is withdrawn from the cartridge by said withdrawing and advancing means; and



means for exerting a compressive force against progressive incremental sections of a film strip as it is being advanced from said receiving and storing means responsive to the operation of said withdrawing and advancing means to facilitate the rupturing of the film strip's pod of processing fluid and the spreading of the released fluid along the length of the film strip containing the recorded images.

4,167,319

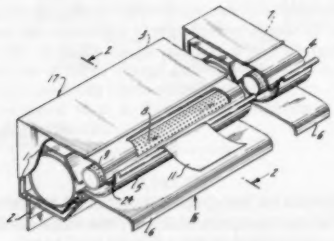
DEVICE FOR AMMONIA FUME REDUCTION

Eduard Feitzinger, Vestal, and Emilio G. Mastroianni, Endicott, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 7, 1977, Ser. No. 785,403

Int. Cl.[2] G03D *7/00*

U.S. Cl. 354—300 **6 Claims**



1. An improved diazo-type copying apparatus having a developing chamber, a transport means within said developing chamber, a means for introducing ammonia gas into the chamber, a first enclosure means for enclosing and sealing the developing chamber from the atmosphere, a second enclosure enclosing and sealing the first enclosure from the atmosphere, an entrance means and an exit means within the second enclosure and the first enclosure for introducing a copy to be developed and expelling a developed copy from the developing chamber wherein the improvement comprises a perforated vacuum tube positioned within the second enclosure adjacent to and traversing the entire length of the exit means of the second enclosure, for collecting ammonia gases that escape the first enclosure as well as relieving the developed copy of ammonia gases and means for exhausting the collected ammonia gases to a neutralizing means prior to release into the atmosphere.

4,167,320

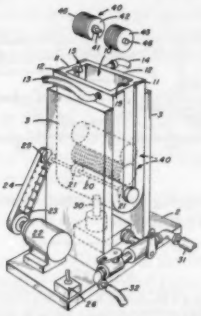
VERTICAL FILM PROCESSING APPARATUS

William J. Hutchinson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 774,720, Mar. 7, 1977, abandoned. This application May 3, 1978, Ser. No. 906,169

Int. Cl.[2] G03D *3/04*

U.S. Cl. 354—323 **8 Claims**



1. Apparatus for photographically processing, in a solution, sets of disc-shaped film elements; each set including (1) a shaft which extends through an aperture in a central section of each element, and (2) generally circular end members of a diameter at least slightly larger than the diameter of the film elements; said apparatus comprising:

a container having a processing chamber for receiving the solution, said chamber being adapted to receive a plurality of the sets in the solution with the shafts extending parallel to each other;

means for rotatably supporting the sets in the solution with the end members of adjacent shafts in drive-transmitting engagement; and

drive means for rotating one of the sets in the solution, rotation of the one set by said drive means causing rotation of the other sets through the engaged end members to thereby enhance the contact between the film elements and the solution.

4,167,321

PHOTOSENSITIVE DRUM FOR ELECTROGRAPHIC APPARATUS

Kiyoshi Miyashita, and Katsuhiko Kimura, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 831,055

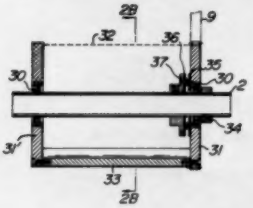
Claims priority, application Japan, Sep. 14, 1976, 51-123744[U]

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 DR **2 Claims**

1. In a photosensitive drum for electrographic apparatus composed of a drum-shaped photosensitive body and means for producing thereon an electrostatic latent image corresponding to a picture image of a manuscript to be reproduced, the improvement comprising means for frictionally braking the rotation of said photosensitive drum comprising a frictional brake device including a brake plate frictionally engaged with a flange rotatably journaled in a bearing mounted on a fixed

shaft and supporting said drum-shaped photosensitive body and a brake spring frictionally engaged with both said brake



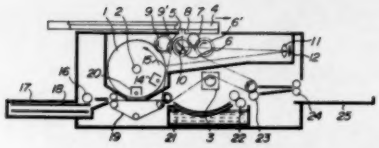


plate and with a spring seat secured to said fixed shaft and urged against said brake plate.

4,167,322

ELECTROSTATIC COPYING SYSTEM HAVING MONITORING DEVICES

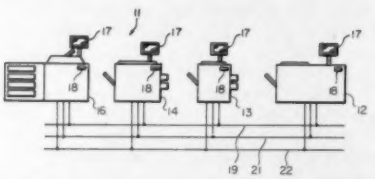
Takashi Yano; Tatsuo Tani; Nachio Seko; Hiroyuki Idenawa, and Isao Nakamura, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 31, 1978, Ser. No. 929,273

Claims priority, application Japan, Aug. 11, 1977, 52-96321; Aug. 12, 1977, 52-96103

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—3 R **10 Claims**



1. An electrostatic copying apparatus including a plurality of electrostatic copying machines and being characterized by comprising a plurality of sensor means connected to the copying machines respectively for sensing at least one copying machine status parameter, display means connected to the copying machines respectively and interconnection means for interconnecting all of the sensor means and display means in such a manner that each display means displays the status parameters of all of the copying machines.

4,167,323

REPRODUCTION APPARATUS FOR PRODUCING SIMPLEX OR DUPLEX COPIES

Charles T. Hage, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,507

Int. Cl.[2] G03G *15/00*

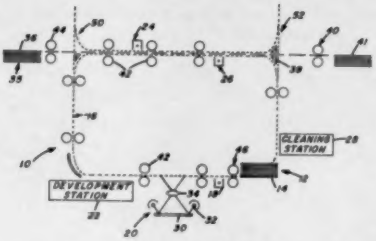
U.S. Cl. 355—3 R **5 Claims**

1. A method for producing duplex copies comprising:

supplying a plurality of individual reusable photoconductive members at a supply location;

sequentially transporting at least first and second photoconductive members from said supply location along a path back to said supply location;

forming first and second transferable toner images on said first and second members respectively as they are transported along said path; and



transferring said first and second toner images from said first and second photoconductive members to the opposite sides respectively of a copy sheet brought into image transferable relationship with said members along an image transfer portion

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4,167,324

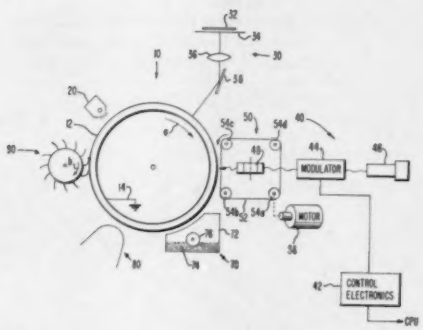
APPARATUS FOR XEROGRAPHICALLY PRINTING A COMPOSITE RECORD BASED ON FIXED AND VARIABLE DATA

Alexander C. Wu, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 17, 1977, Ser. No. 842,405

Int. Cl.[2] G03G *15/00*; G03B *19/00*

U.S. Cl. 355—3 R **14 Claims**



1. Apparatus for xerographically printing information from first and second complementary informational sources onto a record medium comprising:

a photoreceptive medium comprising an electrically conductive base layer and a photoconductive surface layer;

charge deposit means for applying a uniform deposition of charge onto the photoreceptive medium;

first imaging means for imaging a light pattern representative of information from the first source onto the charge deposition on the photoreceptive medium to form a first electrostatic image embodying the information from the first source;

said information from said second source being derived from a central processing unit;

second imaging means for applying an electrostatic charge pattern representative of information from the second complementary source onto the photoreceptive medium over the first electrostatic image to form a composite

electrostatic image embodying the information from both the first and second sources;

said second imaging means including laser means responsive to informational signals from said central processing unit for providing a pattern of light energy representative thereof and stylus means, responsive to said pattern of light energy provided by said laser means, for translating said pattern of light energy into a corresponding electrostatic charge pattern and transferring the charge pattern onto said photoreceptive medium;

developing means for developing the composite electrostatic image on the photoreceptive medium; and

image transfer means for transferring a developed composite image from the photoreceptive medium onto the record medium.

4,167,325

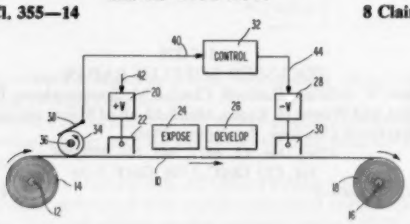
ELECTROGRAPHIC RECORDING APPARATUS

John D. Plumadore, Westfield, Mass., assignor to James River Graphics Inc., So. Hadley, Mass.

Filed Nov. 7, 1977, Ser. No. 848,995

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 **8 Claims**



1. An apparatus for recording on an electrographic medium, said medium comprising an insulative charge retaining layer and a conductive layer, said apparatus comprising:

(a) means for providing a distribution of charge of one polarity on a surface of the medium, said distribution of charge representing a desired image to be recorded on the medium;

(b) sensing means, coupled to the conductive layer, for generating a signal representing the potential of the conductive layer; and

(c) discharge corona means responsive to the sensing means signal, for depositing charge having a polarity opposite of said one polarity on the surface of the charge retaining layer, the level of charge deposited by the discharge corona means being automatically controlled by the sensing means signal so as to maintain the conductive layer at a constant potential.

4,167,326

CONTACT ELECTROSTATIC PHOTOCOPYING PROCESS AND APPARATUS FORMING REVERSED IMAGE MASTER USING WEB-TYPE PHOTOCONDUCTIVE SURFACE

John M. Payne, 13 Crowson Crescent, Northborough, Peterborough, England

Filed Dec. 29, 1977, Ser. No. 865,769

Claims priority, application United Kingdom, Jan. 5, 1977, 00143/77

Int. Cl.[2] G03G *15/22*

U.S. Cl. 355—16 **18 Claims**

1. A method of obtaining an electrostatic photo copy of a document comprising the steps of:

(1) charging electrically a sensitized surface,

(2) bringing the surface into contact with the document with the charged sensitized surface in contact with one face of the document,

(3) illuminating the rear of the sensitized surface so as at least partially to dissipate the electrical charge except in those regions thereof which are in juxtaposition with a darkened region of the one face of the document,

(4) removing the illumination,

(5) separating the document from the partly discharged sensitized surface,

(6) applying a printing medium to the partly discharged sensitized surface so that the printing medium adheres to those regions of the sensitized surface which still retain electrical charge and forming a reversed fixed photocopy of the contacted document,

(7) electrostatically charging a fresh area of sensitized surface and bringing it into contact with the reversed fixed photocopy.

(8) illuminating the reversed fixed photocopy from the rear so as to project an image thereof onto the charged surface of the said fresh area,

(9) removing the illumination and the reversed fixed photocopy, and

(10) processing the now partly discharged said fresh area in the manner as set out in steps (1) to (7) above, so as to produce the electrostatic photocopy.

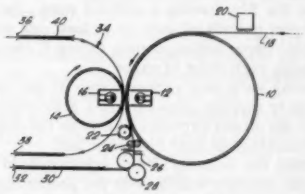
6. Apparatus for performing an electrostatic copying process comprising, in combination:

(1) a first housing having a light-tight compartment,

(2) a roll of sensitized paper within the light-tight compartment,

(3) a flat plate on the underside of the housing,

(4) means for feeding the sensitized paper from the roll with the sensitized surface outermost and stretching same across the said flat plate formed on the underside of the housing,



(5) means for receiving and gripping the sensitized paper beyond the said plate,

(6) A first light source within the housing operable to illuminate the rear of the sensitized paper,

(7) a second housing with which the first housing can cooperate to form a closed container with the sheet of sensitized paper on the said plate sandwiched therebetween,

(8) means within the second housing for dusting the sensitive underside of the sensitized paper with a printing medium whereby the latter will adhere to those regions of the surface of the sensitized paper stretched over the plate which are charged,

(9) a fixing means for fixing the printing medium in place,

(10) means for withdrawing the sheet of sensitized paper with printing medium adhering thereto and passing it through the said fixing means so as to produce a print,

(11) automatic means causing a fresh piece of sensitized paper to be moved into position and stretched across the said plate in the first housing,

(12) means in the said second housing for removably receiving and supporting the aforementioned print,

(13) a second light source for illuminating the print from the underside so as to project light therethrough and form an optical image of the print on the surface of the sensitized paper freshly stretched across the said plate in the first housing and

(14) means for charging the sensitized paper in the first housing to an appropriate potential prior to exposing the paper to the illuminated image of the document or print so

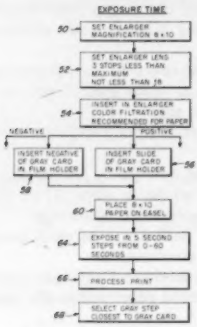
that after such exposure a charge pattern is left forming an electrostatic image of the document.

4,167,327

PHOTOGRAPHIC PRINTING METHOD

Robert F. DiNatale, Old Mill Rd., Sutton, Mass. 01527

Filed Mar. 22, 1978, Ser. No. 888,822
Int. Cl.[2] G03B *27/32, 27/52*
U.S. Cl. 355—77 **8 Claims**



1. A method of photographic printing comprising:

making a stepped exposure of a simulation of a properly exposed gray card for a film to be printed having particular D/log E characteristics, and a film-mask-colored element for film having a colored mask, for a number of different periods of time on at least one sheet of photographic paper having certain D/log E characteristics;

processing each sheet of paper;

comparing each such exposure step of said simulation of a properly exposed gray card to a gray reference to determine the proper exposure time from the step most closely approaching the gray reference; and

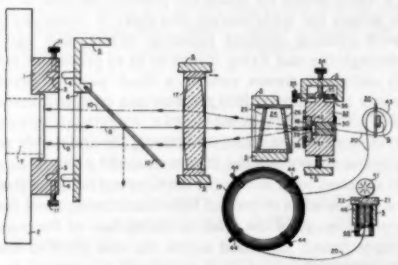
measuring the intensity of the exposing light to obtain the proper intensity which, with the proper time, determines the exposure to be used to print all films having D/log E characteristics generally similar to said particular D/log E characteristics on paper having D/log E characteristics generally similar to said certain D/log E characteristics.

4,167,328

PASSIVE OPTICAL RANGE SIMULATOR DEVICE

Michael A. Cross, Severna Park, and Fred S. Hurt, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittburgh, Pa.

Filed Sep. 28, 1977, Ser. No. 837,067
Int. Cl.[2] G01C *3/08;* G01J *1/02*
U.S. Cl. 356—5 **4 Claims**



1. An improved passive optical range simulator device comprising,

a housing having testing aperture means for registry with working aperture means of an optical radar ranger system via which optical radar pulses leave and return,

means for directing entering and leaving optical radar pulses to and from a common focal spot,

a length of optical fiber including a coiled portion and having one end in registry with said focal spot,

a total optical radar pulse reflector at the opposite end of said length of optical fiber for enabling same to act as an optical delay medium, and

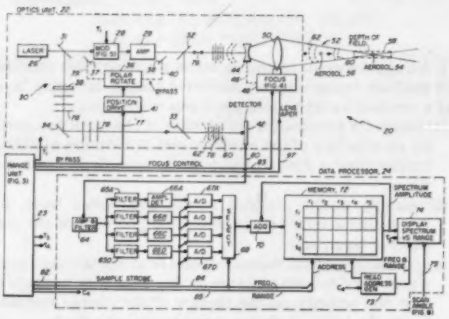
a partial optical radar pulse reflector at the aforesaid one end of said length of optical fiber for generating in such length multiple reflections of an optical radar pulse from the ranger system for observation by such system.

4,167,329

FOCUSSED DOPPLER RADAR

Albert V. Jelalian, Bedford; Charles M. Sonnenschein, Brookline, and Wayne H. Keene, Medfield, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 12, 1977, Ser. No. 859,904
Int. Cl.[2] G01C *3/08;* G01P *3/36*
U.S. Cl. 356—5 **13 Claims**



1. A radar system comprising:

means for generating a beam of radiant energy;

an optical system coupled to said beam for producing a focus, said optical system directing said radiant energy to a scatterer of radiant energy;

means for receiving radiant energy reflected by said scatterer;

means coupled to said optical system for varying said focus to produce a focal range equal to the range of said scatterer from said optical system;

means for modulating said beam of radiant energy;

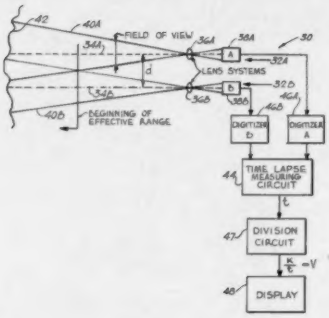
means coupled to said optical system to control said modulating means for providing a pulse of radiant energy having a duration less than the time of propagation of said radiant energy through a distance equal to twice the focal range of said optical system, said control means including means for initiating said modulating of said beam at ranges greater than a predetermined range and means coupled to said focus varying means for initiating said varying of said focus at ranges less than said predetermined range; and

means coupled between said optical system and said receiving means for measuring a component of the velocity of said scatterer.

4,167,330
VELOCITY MEASURING SYSTEM

George D. Haville, Little Rock, Ark., assignor to BEI Electronics, Inc., Little Rock, Ark.

Filed Jul. 8, 1977, Ser. No. 814,131
Int. Cl.[2] G01P 3/36; G01C 3/08
U.S. Cl. 356—28 10 Claims



1. In a velocity measuring system for measuring the velocity of a craft in flight over terrain,

said system comprising first and second directional receiving devices on the craft for receiving radiation from the terrain,

means supporting said first and second directional receiving devices on the craft with said devices aimed along respective first and second parallel radiation paths which are spaced apart by a predetermined distance along a predetermined direction,

each of said receiving devices including electrical signal producing devices for converting the received radiation into corresponding electrical signals,

said signal producing devices being effective to produce signal features corresponding to any radiation features of the radiation received from the terrain,

the velocity of the craft in said direction being effective to produce a time lapse between the signal features from the signal producing devices of said first and second receiving devices,

and time lapse measuring means connected to said signal producing devices of said first and second receiving devices for determining the time lapse between the electrical signal features produced by said first and second receiving devices,

the velocity of the craft as represented by said time lapse being inversely proportional to said time lapse,

the improvement in which said time lapse measuring means comprise first and second digitizers for producing first and second digitized signals corresponding to said electrical signals from said first and second receiving devices,

first and second shift registers for storing said digitized signals,

the stored signals in one of said registers being leading while the stored signals in the other register are lagging due to said time lapse,

circulator means for circulating the lagging signals in the corresponding shift register to bring said signals into correlation with said leading signals,

correlator means connected to said first and second shift registers for detecting such correlation and stopping said circulator means,

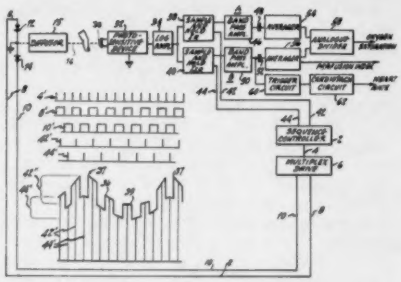
and means for measuring the amount of circulation produced by said circulator means,

said amount of circulation being a measure of said time lapse.

4,167,331
MULTI-WAVELENGTH INCREMENTAL ABSORBENCE OXIMETER

Larry L. Nielsen, Burlington, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 20, 1976, Ser. No. 752,494
Int. Cl.[2] G01N 33/16
U.S. Cl. 356—39 7 Claims



1. In apparatus for indicating the relative percentage of at least one absorber in (a) the arterial blood stream of living tissue, the combination of

means for sequentially directing light of different wavelengths along a given path into which a member of a body may be inserted,

photosensitive means for producing at its output electrical signals having amplitudes that respectively correspond to the intensity of the light of different ones of said wavelengths in said path,

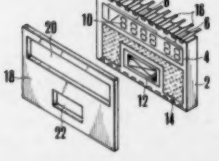
logarithmic means coupled to the output of said photosensitive means for deriving electrical signals that are proportioned to the logarithm of the electrical signals at the output of said photosensitive means, and

separate means alternating current coupled to the output of said logarithmic means so as to receive only the alternating current components of the output of said logarithmic means, each said means deriving an output signal that respectively corresponds to the amplitude of the alternating current component of the electrical signal at the output of said logarithmic means corresponding to a different wavelength of light.

4,167,332
INDICATION AND PHOTOMETRIC UNIT

Nobuaki Sakurada, Yokohama; Nobuhiko Shinoda, Tokyo; Tadashi Ito, Yokohama; Yukio Mashimo, Tokyo, and Fumio Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 622,835, Oct. 16, 1975, abandoned.
This application Feb. 1, 1978, Ser. No. 874,023
Claims priority, application Japan, Oct. 17, 1974, 49/119627
Int. Cl.[2] G01J 1/42; G03B 13/02
U.S. Cl. 356—227 5 Claims



1. An indication and photometric unit provided with a base plate having an insulating surface, comprising:

photometric means, said means being adapted to produce an electric signal corresponding to the reflected light coming from an object;

output signal processing means, said means being adapted to receive an electric signal emitted from said photosensitive means and to produce object brightness information;

means for driving photographic information, said means being adapted to receive a photographic information signal emitted from a photographic information operation means and to produce a driving signal to indicate a photographic information;

means for indicating photographic information, said means being adapted to receive a driving signal emitted from said photographic information driving means to indicate the photographic information;

photographic information operation means, said means being connected with both of the output signal processing means at the output terminal thereof and the base plate of said integrated circuit at the input terminal thereof to receive the photographic information as well as to output an exposure information for controlling the exposure;

said photosensitive means and said processing means as well as said indicating means and said driving means being mounted on the base plate in the same plane;

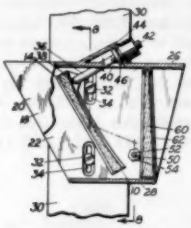
a means for producing an exposure control signal, said means including an integrated circuit exposure control secured on the base plate in the same plane as that of the photosensitive means and connected to the exposure information operation means so as to produce an exposure control signal;

a cover means secured on the base plate for covering and light shielding the output signal processing means, the exposure information processing means, the photographic information driving means and the exposure control driving means secured on the base plate and forming a light receiving opening for the photosensitive means and an opening for exposing the photographic information display means.

4,167,333
AUTOMATIC DISTANCE COMPENSATING SIGHT AND PROCESS OF SIGHTING

James E. Young, 18290 SE. 370th, Sandy, Oreg. 97055; George O. Cushman, deceased, late of Boring, Oreg., and by Ruth N. Cushman, executrix, 33333 SE. Brooks Rd., Boring, Oreg. 97009

Continuation-in-part of Ser. No. 578,530, May 19, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 748,934
Int. Cl.[2] G02B *27/00*
U.S. Cl. 356—247 **8 Claims**

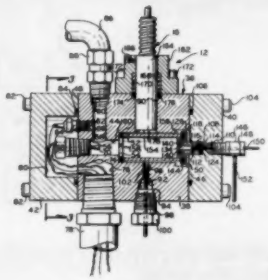


1. An automatic compensating sight for weapons comprising a support arranged to be secured to a weapon, a lens on said support, and a reference point on said support associated with said lens, the refraction of the lens being of predetermined arrangement such that image portions appearing at lower parts thereof are displaced up and image portions appearing at upper parts thereof are displaced down, an intermediate portion of said lens being zero power, whereby in placing the reference point a selected distance below a bottom line of the image of a target as viewed in the lens by movement of said support with the weapon, the weapon is properly aimed to automatically compensate for the flight of the projectile according to the distance between the weapon and the target.

4,167,334
FLAME HEAD FOR FLAME PHOTOMETRIC DETECTOR USED IN GAS CHROMATOGRAPHY

Lawrence D. Phillips, Caney, Kans., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Mar. 30, 1978, Ser. No. 891,979
Int. Cl.[2] G01N *21/58, 31/08*
U.S. Cl. 356—315 **15 Claims**



1. A photodetection flame head comprising:

a body having a combusiton chamber therein;

a translucent barrier tube carried by said body, the interior of said barrier tube defining at least a portion of said combustion chamber;

a burner tip communicating with said combustion chamber and having a central passage therethrough communicating with the interior of said combustion chamber, and a plurality of peripheral passages therethrough and circumferentially spaced about said central passage, said peripheral passages communicating with the interior of said combustion chamber;

conduit means communicating the central passage of said burner tip, a source of fuel, and a source of fluid to be analyzed;

passage means communicating between the peripheral passages of said burner tip and a source of oxygen;

fiber-optic light transmission means having first and second end portions with the first end portion thereof positioned adjacent the exterior of said barrier tube for transmitting light from said combustion chamber through said fiber-optic light transmission means; and

an exhaust passage communicating between the interior of said combustion chamber and the exterior of said body.

4,167,335
APPARATUS AND METHOD FOR LINEARIZING A VOLUME LOADING MEASUREMENT UTILIZING PARTICLE SCATTERING

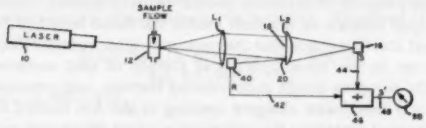
Frederick L. Williams, Lansdale, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Dec. 16, 1977, Ser. No. 861,224
Int. Cl.[2] G01N *15/02*
U.S. Cl. 356—336 **8 Claims**

5. An improved apparatus for measuring the volume loading of a collection of particles suspended in a fluid sample, which apparatus measures a portion of the light diffracted by said particles from a coherent light beam directed through said sample to produce a signal whose magnitude varies with the volume of said particles, the improvement comprising:

means responsive to the intensity of the undiffracted portion of said beam after it has passed through said sample for

producing another signal representing the intensity of said undiffracted beam; and



means for dividing said diffracted light signal by said other signal to produce a resulting signal having a linear relationship to the magnitude of said volume loading over a wide range of values.

4,167,336

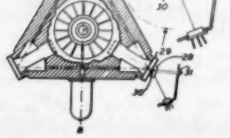
RING LASER GYROSCOPE HAVING WEDGE DESENSITIZING OPTICAL MEANS

Bo H. G. Ljung, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Mar. 29, 1977, Ser. No. 782,460

Int. Cl.[2] G01B *9/02*; G01P *9/00*

U.S. Cl. 356—350 **11 Claims**



1. A ring laser gyroscope comprising:

means configured to be symmetrical about its axis of symmetry for eliminating temperature gradients across said axis of symmetry and supporting two counter-rotating beams of monochromatic light along a closed loop about a rotation axis, a difference in frequency occurring between said beams due to rotation about said rotation axis,

means attached to said supporting means for displacing one of said monochromatic beams at the exit of said supporting means, and

means for redirecting said beam from said displacing means along a separate optical path so as to reduce the sensitivity of the interferometer formed between said displacing means and said beam redirecting means to render the sensitivity of the thus formed interferometer exactly equal and opposite the sensitivity of said laser gyroscope.

4,167,337

INTERFEROMETRIC APPARATUS AND PROCESS

Walter Jäerisch, Boeblingen; Güenter Makosch, Sindelfingen-Maichingen, and Arno Schmackpfeffer, Boeblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 13, 1977, Ser. No. 806,132

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627609

Int. Cl.[2] G01B *9/02*

U.S. Cl. 356—354 **8 Claims**

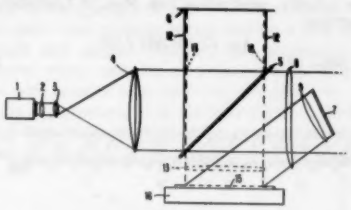
1. Interferometric apparatus for determining and measuring defects on an object comprising:

a coherent light source;

a beam expanding means for expanding the beam provided by said coherent light source;

a beam splitting means positioned in the beam path for splitting said beam into first and second components;

a stationary object having a periodically structured surface positioned in a plane at a fixed angle with respect to said beam splitting means;



a first mirror for reflecting one of said first and second components onto said object, causing the said one of said first and second components to be diffracted from said object;

said beam splitting means being positioned in the path of said diffracted beam such that said first and second components thereby interfere with each other; and

display means for observing resultant interference patterns formed by said first and second components.

4,167,338

METHOD AND APPARATUS FOR DETERMINING THE QUANTITY RATIO OF TWO COMPONENTS OF A MULTI-SUBSTANCE MIXTURE

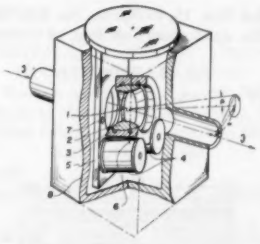
Thaddaus Kraus, Triesen, Liechtenstein, assignor to Balzers Patent- und Beteiligungs Aktiengesellschaft, Liechtenstein

Filed Sep. 7, 1977, Ser. No. 831,134

Claims priority, application Switzerland, Sep. 14, 1976, 11626/76

Int. Cl.[2] G01J *3/42, 3/48*

U.S. Cl. 356—414 **4 Claims**



1. Method for determining the quantity ratio of two components of a multi-substance mixture, whose absorption bands are adjacent to each other and overlap, using an interference filter comprising rotating an interference filter in a uniform rotation about a first axis through the filter plane which forms with a perpendicular erected on the filter plane a fixed angle beta$\neq$0, and which is rotatably arranged about a second axis through the filter plane, adjusting the angle (alpha) which the axis of rotation forms with the ray in the range beta$<$alpha so that a signal corresponding to the first derivative of the spectral intensity distribution of the radiation transmitted by the substance mixture just passes through zero, and using a quantity correlated with this angle as measure of the quantity ratio.

4,167,339

SCREW COMPRISING A PLURALITY OF HOLLOW SCREW COMPONENTS JUXTAPOSED IN END-TO-END RELATION

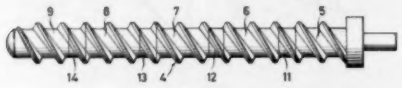
Dietmar Anders, Hannover-Kleefeld, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Fed. Rep. of Germany

Filed Jun. 11, 1975, Ser. No. 585,744

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1974, 2457016

Int. Cl.[2] B29B *1/06*

U.S. Cl. 366—79 **2 Claims**



1. A screw for extruding rubber or plastics material comprising:

at least three hollow screw components juxtaposed in end-to-end relation, each of said screw components having screw webs on the outer surfaces thereof and being formed with exterior axially extending splines and an annular recess adjacent said splines in the ends of said screw components;

a coupling sleeve disposed over each joint between each adjacent screw components, said coupling sleeve being formed with axially extending splines on the internal face thereof which engage in the splines in the ends of said screw components to secure said screw components and said coupling sleeve against relative rotation, said coupling sleeve being further formed with cylindrical end faces which engage said annular recesses formed in the ends of said adjacent screw components, the exterior surface of said coupling sleeve being flush with the exterior surfaces of said screw components, and

means to secure said screw components and said coupling sleeve against relative axial movement.

4,167,340

DOUGH MIXING AND KNEADING DEVICE

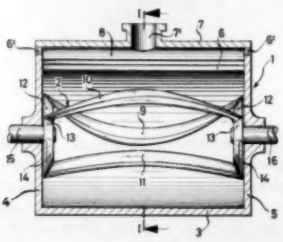
Bernhard Heimbrecht, Langenhagen, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,780

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713450

Int. Cl.[2] B01F *7/08*

U.S. Cl. 366—99 **10 Claims**



1. A dough mixing and kneading device comprising in combination: a substantially horizontally disposed cylindrical container including end walls, a mixing and kneading tool coaxially disposed in said container and including drive shaft means journalled in said end walls, a plurality of mixing and kneading blades, and radially extending support arms for said blades, each of said arms extending from said drive shaft means and being secured to the respective blade, the arms being circumferentially spaced relative to one another and having radial lengths different from the arms of other blades, thereby causing the blades to travel along circular paths of different diameters upon rotation of the shaft means, the radial length of the longest arm being such that the respective blade rotates closely adjacent to the inner cylindrical surface of said container thereby scraping dough accumulating thereon, said container having a lengthwise elongate opening at the top thereof for loading and emptying the container; a cover above said container for closing said opening in said container, said cover being disposed in register with said opening when the container is in an operating position, said container being pivotal about its center axis to a position in which said opening is clear of the cover for emptying the container and a frame extending outwardly from said container and secured thereto along the edge of said opening for sealing said opening by the cover, said container and frame having aligned radially inclined edges at said opening to form a substantially pocket-shaped space at the top of the container in said operating position.

4,167,341

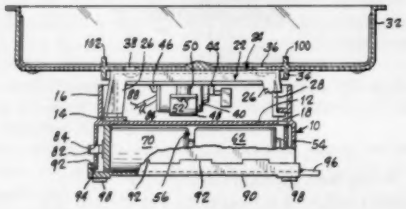
VIBRATORY ACTION CLEANING DEVICE

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

Filed Oct. 6, 1978, Ser. No. 949,123

Int. Cl.[2] B01F *11/00*

U.S. Cl. 366—114 **5 Claims**



1. A vibratory action cleaning device comprising:

a housing having a top platform with resilient pads thereon and a peripheral flange which extends up from the platform and has recesses at its inner side;

a table which has a top and legs depending from the top and fitting loosely within said flange of the platform and resting on said resilient pads and further has resilient tabs which snap-fit loosely into said recesses of the flange to interlock therewith, said table being capable of limited movement relative to the housing but being prevented from separating from the housing by the fit of the table legs within the flange and the interlock between the table tabs and the flange recesses;

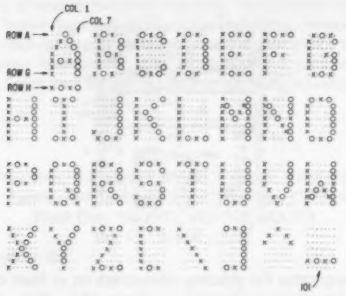
an open-top container for a cleaning agent into which articles to be cleaned can be immersed located on the table and means for securing the container to the table to keep the container from sliding off the table despite vibratory movement of the table;

an electric motor affixed to the underside of the table top and having an eccentrially weighted shaft and means for selectively energizing the motor to drive the shaft into rotation to thereby vibrate the motor and the table to which it is affixed, said vibration in turn causing vibration of the container supported by the table and agitation of any cleaning agent and articles to be cleaned that may be in the container.

4,167,342
CONTROL SYSTEM FOR MATRIX PRINT HEAD

Dan C. Mower, Agoura; Peter H. Wolf, Campbell; Boyd E. Slade, Sunnyvale, and David Albertalli, San Jose, all of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Jun. 13, 1977, Ser. No. 805,705
Int. Cl.[2] B41J *3/12*
U.S. Cl. 400—124 **16 Claims**



1. In a system for printing dot-matrix characters of the type having a printing head and means for causing said printing head to scan across a printing medium at a predetermined speed which comprises:

(a) a printing head including a plurality of groups of dot forming elements, each of said elements being individually actuatable to print in any matrix column, one of said groups having at least one dot forming element horizontally aligned with a dot forming element of another of said groups; and

(b) character generator means for generating actuation signals for said dot forming elements, said character generator means including memory means for storing the matrix locations of dots required to form characters, said locations not including locations which would cause any dot forming element to be actuated more than once for each four matrix columns and whereby for certain columns of certain characters dots are formed by elements of a plurality of groups of dot forming elements.

8. A method of printing dot-matrix characters using dot forming elements which comprises:

(a) dividing the dots of each character into a plurality of groups whereby any dot to be printed in any row of any character is separated from any other dot in said row belonging to the same group by more columns than the number of said groups; and

(b) printing each of said groups of dots by a separate group of dot forming elements said printing for certain columns of certain characters including dots belong to different groups.

4,167,343
PRINT WIRE ACTUATOR MECHANISM

Gary L. Golobay, 1215 Helen, Augusta, Kans. 67010

Continuation of Ser. No. 726,432, Sep. 27, 1976, abandoned. This application Jan. 19, 1978, Ser. No. 870,826
Int. Cl.[2] B41J *3/12*
U.S. Cl. 400—124 **7 Claims**

1. In a wire matrix printer system operable to print dots on a readout sheet material, a print wire actuator mechanism, comprising:

(a) a print wire actuator means including a print wire assembly connected to a central collector member and operably connected to a solenoid member;

(b) a permanent magnet collector means having a magnet member mounted against one side of said central collector member;

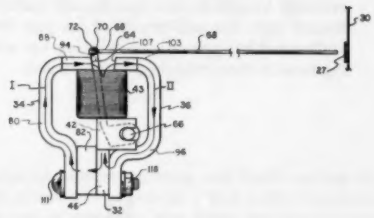
(c) a solenoid collector means having a solenoid collector member mounted against one other side of said central collector member;

(d) said print wire assembly including a print wire member connected to an armature assembly;

(e) said print wire member moved to an actuation print stroke on energization of said solenoid member;

(f) said print wire actuator means having a first flux path through said magnet member, said permanent magent collector means, and said armature assembly to hold said print wire member in an inactive, rest, position;

(g) on the energization of said solenoid member, the first flux path is cancelled and a second flux path is created through



said solenoid member, said central collector member, and said solenoid collector means to urge said print wire member to a print, actuated position having a portion of said armature assembly in contact with said solenoid collector member;

(h) said central collector member having a pair of spaced, upright solenoid support arms;

(i) said solenoid member mounted about said solenoid support arms to form a central cavity therebetween;

(j) said armature assembly having a main armature body mounted within said cavity and baised toward said permanent magnet collector means by said magnet member and said first flux path; and

(k) energization of said solenoid member biases said main armature body toward said solenoid collector means under flux forces of said second flux path.

4,167,344
ELECTRONICALLY CONTROLLED TOKEN ENGRAVING APPARATUS

Cliff R. High, Tacoma, and Karl D. Falaschi, Puyallup, both of Wash., assignors to Morley Studios, Tacoma, Wash.

Filed Jul. 1, 1977, Ser. No. 812,279
Int. Cl.[2] B41J *3/40*
U.S. Cl. 400—130 **38 Claims**

1. An electronically controlled token engraving apparatus comprising:

(A) a mechanical mechanism for engraving tokens, said mechanical mechanism including:

(1) token movement means for moving a token along a path of travel between a token receiving station, a token engraving station and a token ejection station;

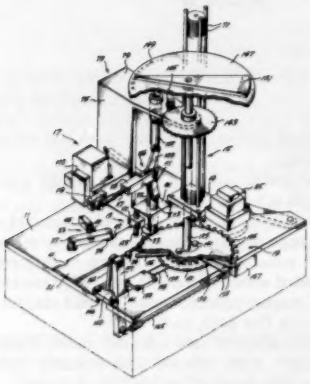
(2) token supply means located at said token supply station for supplying blank tokens to said token movement means;

(3) token engraving means located at said engraving station for engraving characters at predetermined positions in a token located at said token engraving station said token engraving means comprising:

(a) a typehead including a plurality of radial type bars, a character type being located on the lower peripheral surface of each type bar, said typehead mounted such that a selected type bar can be positioned above

the upper peripheral surface of a token located at said token engraving station; and,

(b) a press located above a radial type bar when said radial type bar is positioned above a token located at said token engraving station such that actuation of said press moves the outer periphery of said so located type bar downwardly into engraving contact with the upper peripheral surface of said token whereby a character is engraved into the upper peripheral surface of said token, said press including a vertically movable presshead and wherein said typehead includes a protection disk affixed to said type bars, above said type bars, said protection disk including a scalloped outer periphery, said scallops being equal in number to the number of type bars, said protection disk being mounted such that a type bar is centrally located in each scallop, said scallops being formed such that said presshead can pass through a scallop and impinge on a related type bar when said typehead is appropriately positioned; and,



(4) token ejection means located at said token ejection station for controlling the ejection of tokens from said electronically controlled token engraving apparatus; and

(B) an electronic subsystem for controlling said mechanical mechanism, said electronic subsystem comprising:

(1) token control means, connected to said token movement means and to said token ejection means, for controlling said token movement means such that said token movement means moves tokens between said token receiving station, said token engraving station and said token ejection station in a predetermined manner and for controlling said token ejection means such that engraved tokens are ejected from said electronically controlled token engraving apparatus subsequent to said tokens being engraved by said engraving means; and

(2) token engraving control means connected to said token engraving means for controlling said token engraving means such that said token engraving means engraves characters at predetermined positions in said token.

4,167,345

PRINTING APPARATUS WITH SELECTIVELY MOVABLE PRINTING HEADS

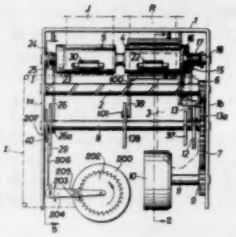
Cösta R. Englund, Stockholm, and Karl T. Wincent, Upplands Vasby, both of Sweden, assignors to Svenska Kassaregister AB, Sundbyberg, Sweden

Filed Jul. 14, 1977, Ser. No. 815,705

Claims priority, application Sweden, Aug. 11, 1976, 7608992

Int. Cl.[2] B41J *15/22*

U.S. Cl. 400—588 **10 Claims**



1. An apparatus for printing characters on at least one data carrier, comprising a printing head movable along the data carrier, line advance means for feeding the data carrier substantially perpendicular to the moving direction of the printing head, and at least one of an ink ribbon feed means for feeding an ink ribbon in relation to the data carrier and a cut-off means for cutting off the data carrier, characterized by a shaft (**8**) rotatable less than 360° in one direction by a motor (**10**) from a home position to an end position determined by the selected operation cycle and thereafter back to the home position again reversing the direction of rotation of the shaft, the reversal of the direction of rotation of the shaft being performed at different points of time during subsequent operation cycles to permit motion transmitting means (**7**; **12**; **29**; **37**; **40**) on the shaft to move the printing head to positions determined by the number of characters to be printed on the data carrier, actuation of the line advance means, and actuation of at least one of the ink ribbon feed means and cut-off means.

4,167,346

APPARATUS FOR THE TIMED TRANSPORTING OF FORMS

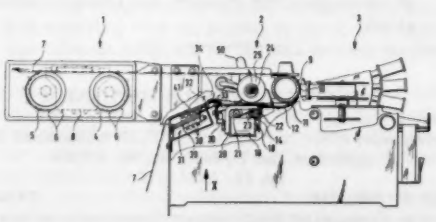
Günter Holland-Letz, Paderborn, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Aug. 8, 1977, Ser. No. 822,389

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1976, 2537402

Int. Cl.[2] B41J *15/00*

U.S. Cl. 400—618 **21 Claims**



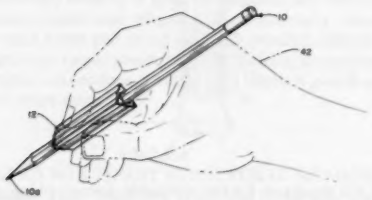
1. Apparatus for the timed transporting of forms over a writing beam of a printing device, comprising a transporting device mounted downstream of the writing beam for causing the forms to make a timed movement of advance; at least one brake flap biased so that a free end of the brake flap engages, in

use, a form passing over the writing beam, immediately upstream of the writing or printing area and a lifting device associated with the or each brake flap for lifting the brake flap away from the form during transport of the form, said apparatus having an entry for the forms upstream of the brake flaps, a plurality of marginal stops positioned at the entry for the forms, at least some of which are movably mounted on a track extending perpendicular to the direction of advance of the forms, these marginal stops determining the guide path for the forms and being capable of being set in pairs to fit the edges of the forms and wherein at least some of the marginal stops have switching elements mounted thereon, functionally associated with the brake flaps and wherein the switching elements determine the individual association of the different brake flaps with forms being transported simultaneously and parallel to one another, depending on the position of the marginal stops on the track.

4,167,347
WRITING INSTRUMENT REMOVABLE FINGER GRIP

James E. Hoyle, 302 Orange Grove, Fillmore, Calif. 93015

Filed Oct. 19, 1977, Ser. No. 843,372
Int. Cl.[2] B43K *23/02*
U.S. Cl. 401—88 **2 Claims**



1. A removable finger grip for writing instruments, comprising:

an elongate resilient body having a substantially triangular cross-sectional closed shape providing planar gripping surfaces;

a bore extending through the center of said body;

said bore being formed to provide thickened areas at the corners of said substantially triangular cross-sectional shape and a thin wall portion along the length of each planar gripping surface;

a plurality of inwardly extending ridges along the length of the bore at the areas coinciding with the thickened corners;

whereby said finger grip can accommodate a variety of sizes of writing instruments.

4,167,348
PAINT ROLLER SUPPORT TRAY

Gary D. Hawk, Iola, Kans., assignor to Harding Development Company, Clearwater, Fla.

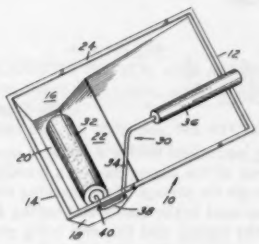
Continuation-in-part of Ser. No. 636,684, Dec. 1, 1975, which is a continuation-in-part of Ser. No. 549,639, Feb. 13, 1975, Pat. No. 3,947,135, which is a continuation-in-part of Ser. No. 380,603, Jul. 19, 1973, Pat. No. 3,870,420. This application Jan. 25, 1977, Ser. No. 762,775
Int. Cl.[2] B44D *3/12*
U.S. Cl. 401—121 **1 Claim**

1. In a paint tray for use with a paint roller or the like, said paint roller having a bent wire frame supporting a paint applying portion at one end and having a handle at the other end, said paint tray including front and rear ends, opposed side walls, a paint well adjacent to said rear end for storing a supply of paint, and an integral inclined surface tapering upwardly from said paint well to said front end for rolling excess paint off said paint applying portion whereby excess paint flows into said well, the improvement comprising:

a receptacle in said paint tray for receiving and retaining said bent wire frame for supporting the paint applying roller above the paint well;

said receptacle including a slot, said slot being elongated in a direction from said paint tray front end to said paint tray rear end for receiving the bent part of said bent wire frame, said slot being at an angle generally parallel to said inclined surface to provide proper orientation of said handle on said front end of said tray;

said receptacle slot extending through the side wall of said tray;

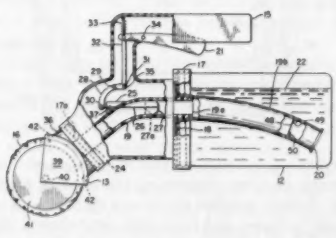


a three-point support including said handle resting on said front of said tray to provide a first point of support, said bent part of said bent wire frame and the edge of said receptacle being in contact in two places to provide second and third support points in supporting the paint applying roller above the paint well and to permit said paint applying portion to be suspended above and substantially parallel to the plane of said well, said second support point being between the top surface of said slot and a top portion of said bent part of said bent wire frame and said third support point being between the bottom surface of said slot and a bottom portion of said bent part.

4,167,349
APPLICATOR FOR LIQUID COATING COMPOSITIONS

Dominick Testa, 29 Monaghan Rd., Edison, N.J. 08811

Filed May 19, 1978, Ser. No. 907,799
Int. Cl.[2] B05C *1/04, 17/02*
U.S. Cl. 401—144 **21 Claims**



14. A device for hand pumping a liquid comprising:

(a) a hollow body portion having a distribution opening at one end and a container opening at the opposite end; said portion containing;

(1) a liquid feed tube extending from said applicator opening through said container opening;

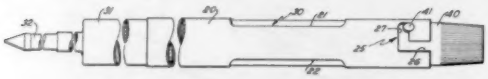
(2) a solid support member mounted in said portion engaging a portion of the outside surface of said tube;

(3) a rod reciprocatingly mounted in said solid support member and extending through the wall of said tube and along the inside axis of said tube;

(4) a flexible disc centrally mounted on said rod with in said tube having a diameter substantially the same as the inside diameter of said tube; and

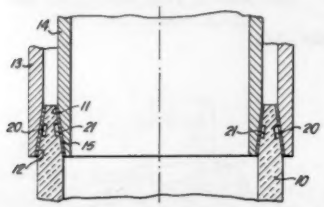
(b) a hollow handle portion contiguous with said body portion having pivotably mounted therein a trigger, said trigger connected by linking means with said rod for reciprocating said rod within said tube.

4,167,350
WRITING INSTRUMENT
Robert L. Harris, North Scituate, R.I., assignor to A. T. Cross Company, Lincoln, R.I.
Filed May 11, 1977, Ser. No. 796,014
Int. Cl.[2] B43K *2/00*
U.S. Cl. 401—260 **2 Claims**



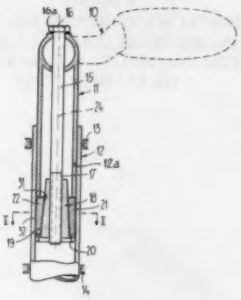
1. A writing instrument having a casing, a marking element, the forward end of the casing having a conical point with a bore therethrough for passage of the marking element, a cylindrical sleeve secured in the casing and having a free end protruding from the casing, said free end being provided with a bayonet pin receiving slot, a cylindrical plug provided with a radially protruding pin for insertion into the bayonet slot, a compression spring in the plug acting on the marking element in a longitudinal direction to snugly hold the marking element in the sleeve against an abutment surface, said radially protruding pin extending across said plug confining said spring in said plug.

4,167,351
METAL-TO-CERAMIC SEALS
Peter J. Bindin, Runcorn, England, assignor to Chloride Silent Power Limited, London, England
Filed May 19, 1977, Ser. No. 798,277
Claims priority, application United Kingdom, May 20, 1976, 20959/76
Int. Cl.[2] F16B *7/02*; F16C *9/00*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—30 **21 Claims**



1. A method of securing annular metal elements to a cylindrical ceramic member comprising the steps of forming said cylindrical ceramic member at one end thereof with inner and outer shaped surfaces, said inner and outer shaped surfaces of said ceramic member each having at least one annular groove, putting elements or coatings of relatively soft metal over said inner and outer shaped surfaces, putting inner and outer annular metal elements having shaped surfaces over the respective soft-metal covered inner and outer shaped surfaces of the ceramic, the shaping of said shaped surfaces of the metal elements being such that the internal diameter of the outer element decreases in the direction towards the end of the cylindrical member and the external diameter of the inner element increases in this direction over the same portion of the member, the inner and outer annular members being of a metal which is hard compared with the aforementioned soft metal and having coefficients of thermal expansion such that the coefficient of expansion of the outer annular member is greater than that of the ceramic material and that of the inner annular member is less than that of the ceramic material, heating the assembly and, when the assembly is hot, forcing the annular members axially into tight engagement with the ceramic material whereby the ceramic material is tightly secured on cooling betv een the two annular members.

4,167,352
APPARATUS FOR THE RELEASABLE FORCE-LOCKING OF TWO TELESCOPIC TUBES, ESPECIALLY FOR CLAMPING THE STEERING HOUSING TUBE IN THE STEERING FORK TUBE OF A BICYCLE
Oskar Pletscher, Marthalen, Switzerland, assignor to Gebrueder Pletscher, Marthalen, Switzerland
Filed Sep. 25, 1978, Ser. No. 945,688
Claims priority, application Austria, Oct. 6, 1977, 87135/77
Int. Cl.[2] F16B *2/14*
U.S. Cl. 403—104 **10 Claims**

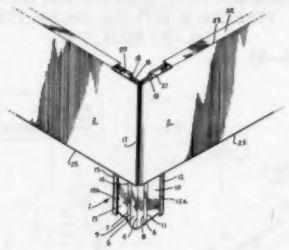


1. An apparatus for the releasable, force-locking connection of two telescopic tubes, especially for clamping the steering housing tube within the steering fork tube of a bicycle, comprising:
a first and second tube defining an inner tube and an outer tube telescopically arranged with respect to one another;
an expanding cone;
a threaded spindle for axially displaceably arranging the expanding cone within the inner tube;
said expanding cone having an outer surface;
said inner tube having a number of guide slots;
each guide slot having an essentially closed outline and extending essentially parallel to the lengthwise axis of the tubes;
a respective wedge arranged within each guide slot;
said expanding cone coacting with the wedges for outward displacement of said wedges;
the longitudinal plane of at least one of the guide slots and its related wedge being arranged in offset relationship in relation to the lengthwise axis of the tubes.

4,167,353
DISPLAY DEVICE
James L. Gebhardt, Roswell, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Jul. 12, 1978, Ser. No. 923,914
Int. Cl.[2] F16B *9/02*
U.S. Cl. 403—231 **7 Claims**

1. A display device comprising a corner post having a pair of vertically disposed corner strips arranged in substantially normal relation to each other, a pair of generally parallel vertically disposed junction strips inwardly offset toward each other and respectively connected along one side edge thereof to the inner side edges of said corner strips, a pair of vertically disposed support strips respectively connected along one side edge thereof with the other side edges of said junction strips and disposed in substantially normal relation to each other, a pair of horizontally disposed header panels arranged in substantially

normal relation to each other and secured at their adjacent ends to said corner post, and wherein the improvement comprises a pair of double back end panels respectively secured to the adjacent ends of said header panels and arranged in generally parallel inwardly disposed relation with respect thereto, a pair of junction panels inwardly offset toward each other and respectively secured to the inner edges of said double back end



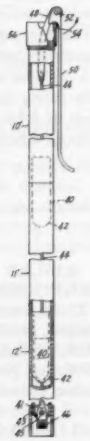
panels and disposed in generally parallel relation and in close proximity to said junction strips respectively, a pair of support panels respectively secured to the inner edges of said inwardly offset junction panels and disposed in substantially normal relation to each other and in substantially parallel relation to said support strips respectively, and interlocking means forming disjointable connections between said support panels and said support strips respectively.

4,167,354

ELONGATED MULTIPART STRUCTURAL MEMBER

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Filed Mar. 13, 1978, Ser. No. 885,685
Int. Cl.[2] F16D *1/00*; F16G *11/00*
U.S. Cl. 403—291 **9 Claims**



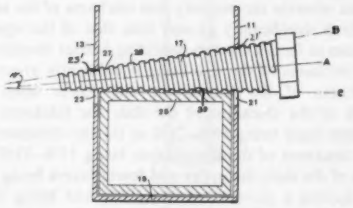
1. An elongated multipart structural member comprising:
a plurality of elongated sections of substantially uniform cross section adapted to be joined together coaxially in end to end relationship to form said member,
an elongated tension element secured at opposite ends of said member for holding said sections together,
means for tensioning said element, and
a sleeve adjacent the juncture of each pair of adjacent sections and movable along said member from a position uncovering such juncture to a position covering such juncture for preventing relative lateral movement of the adjacent sections.

4,167,355

ATTACHMENT DEVICE AND ASSEMBLY

Erik G. Hansson, Sandhem, Sweden, assignor to Svenska Kram AB, Falköping, Sweden

Filed Feb. 14, 1978, Ser. No. 877,744
Int. Cl.[2] F16B *2/14*
U.S. Cl. 403—374 **16 Claims**



1. An assembly comprising
a first structure including first and second substantially parallel spaced apart plates; means defining an aperture in each of said first and second plates having a given area, said aperture defining means including edge means for each of said first and second apertures having a thickness for engaging within the grooves of a conically threaded member and allowing longitudinal displacement of such threaded member upon rotation thereof when in engagement with said edge means; a line perpendicular to said plates passing through both said first and second apertures;
a second structure operatively abutting said first structure and having a generally planar surface portion, a line in the plane of said surface portion passing through both said first and second apertures;
means for attaching said first and second structures together so that substantial relative movement therebetween is prevented by applying forces to said edge means and surface portion tending to push said surface portion and edge means apart, said means comprising a conically shaped, conically threaded member having a given cone angle and uniform pitch, and adapted to engage said edge means and to operatively abut said surface portion, said member being longer than the distance between said parallel plates, and said threaded member having flattened thread ridges;
said first aperture shaped to receive said threaded member and having an area substantially larger than at least the smallest cross-sectional area of said member, and said second aperture shaped to receive said threaded member and having an area larger than the cross-sectional area of said threaded member portion adjacent thereto when a portion of the threaded member is received by said first aperture, said first and second apertures being spaced apart a distance corresponding to a multiple of said threaded member pitch; and
the angle formed between a line tangent to said edge means, and a line in the plane of said surface portion, being equal to said cone angle of said threaded member.

4,167,356

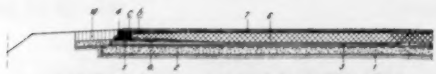
ROADWAY STRUCTURES

Victor Constantinescu, Braila, Romania, assignor to Consiliul Popular al Judetului Braila, Braila, Romania

Continuation-in-part of Ser. No. 675,181, Apr. 8, 1976, abandoned, which is a continuation of Ser. No. 527,014, Nov. 25, 1974, abandoned. This application Feb. 28, 1977, Ser. No. 772,447

Int. Cl.² E01C *3/00*

U.S. Cl. 404—31 **4 Claims**



1. In a roadway structure comprising an elastic foundation and a continuous, composite multi-layer slab overlying and supported by the foundation, the slab having lower, intermediate and upper layers successively bounded together, the improvement wherein the porosity and thickness of the intermediate layer is significantly greater than that of the upper and lower layers to form a thermo-insulating barrier therebetween, the total thickness of the slab being significantly greater than the thickness of the foundation; the lower layer being 10%–20% of the thickness of the slab; the thickness of the intermediate layer being 55%–75% of the the thickness of the slab; the thickness of the upper layer being 15%–25% of the thickness of the slab; the upper and lower layers being from a material having a porosity of about 4% and being selected from the group consisting of asphalt concrete, polymer concrete and compact cement concrete.

4,167,357

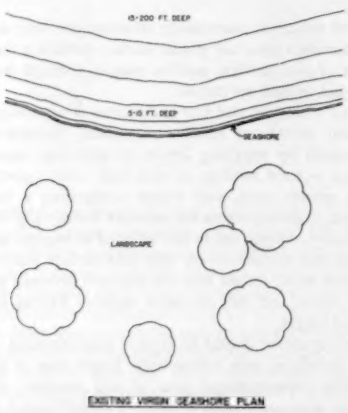
RAPID CONSTRUCTION OF DEEP INTERNATIONAL PORTS, AT SHALLOW SEASHORES, WITHOUT DREDGING

Ahmed A. Assad, P.O. Box 37, El Cerrito, Calif. 94530

Filed May 5, 1978, Ser. No. 897,927

Int. Cl.² B63C *1/00*

U.S. Cl. 405—1 **3 Claims**



1. A method of providing docking facilities consisting of excavating adjacent to a body of water, said excavation being of a predetermined width and depth, and extending from a point above the high water level of said body of water to a point inland determined by the length of said facility; extending the lower portion of said excavation by tunneling under said body of water to a point where the designed depth of said facility substantially coincides with the level of the bed of said body of water and then effecting the removal of all material separating said tunnel and said water.

4,167,358

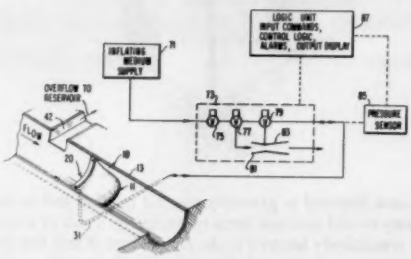
OPEN-CHANNEL FLOW CONTROL SYSTEM

James A. Besha, Box 147C, Sickle Hill Rd., Berne, N.Y. 12023

Filed Oct. 4, 1977, Ser. No. 839,173

Int. Cl.² E02B *7/00*

U.S. Cl. 405—87 **23 Claims**



1. A fluid flow control system for use in an open channel having a generally semicircular cross-section, said system comprising a flexible bladder adapted to lie in the bottom of said open channel, said bladder having a substantially semielliptical shape in plan and a linear edge substantially equal in length to the circumference of said semicircular channel and extending transversely thereof, retainer means holding the portion of said bladder along said linear edge against the bottom of said channel and contoured substantially the same as said channel, said bladder having an inlet opening, conduit means associated with said channel and communicating with said bladder inlet opening, regulating means for selectively delivering an inflating medium through said conduit means to said bladder to inflate said bladder, said regulating means being selectively operable to positively withdraw said inflating medium from said bladder to collapse said bladder, said bladder, when inflated, substantially filling the open channel, said bladder being substantially free of folds or creases in both its inflated and collapsed conditions which could inhibit inflation or collapse thereof.

4,167,359

DOWEL DEVICE FOR GROUTING IN A DRILLHOLE

Robert L. W. Beveridge, Troon, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 818,267, Jul. 22, 1977. This application Jul. 6, 1978, Ser. No. 922,355

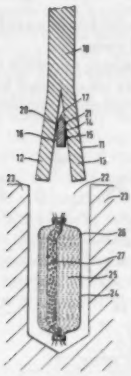
Claims priority, application United Kingdom, Aug. 13, 1976, 33803/76

Int. Cl.² E21D *20/02*

U.S. Cl. 405—259 **13 Claims**

1. A dowel device insertable in a drillhole for grouting therein, said device comprising an elongate dowel element made of material capable of flexing under load, said dowel element having an end portion split into two substantially straight end segments, and a wedge member disposed in the opening between said segments in engagement with the inner faces of said segments to flare said segments radially, said wedge member being shaped so that the place of engagement with at least one of said segments is at a position spaced sufficiently from the dowel end that the end portion of said one

segment is left free to flex inwardly under a predetermined tensile load on the dowel which is less than the tensile load



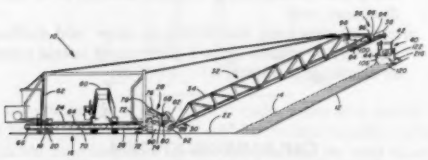
required to break the dowel whereby the tensile load is partially released.

4,167,360

PROCESS AND APPARATUS FOR APPLYING AND COMPACTING CASTABLE MATERIAL IN STRIPS ON A SLOPED SURFACE

Perry J. Dick, Jr., Pittsburgh, Pa., assignor to Trumbull Corporation, Pittsburgh, Pa.

Division of Ser. No. 784,073, Apr. 4, 1977. This application May 19, 1978, Ser. No. 907,561
Int. Cl.[2] E02D *5/00*
U.S. Cl. 405—271 **6 Claims**



1. Process for paving a sloped surface with a castable material in a strip comprising,

depositing the castable material onto the sloped surface,

spreading the castable material outwardly a preselected lateral distance from the sloped surface,

forming a first strip having a preselected thickness and an upper surface extending longitudinally on the sloped surface,

rounding the lateral edge of the first strip in an arcuate configuration to form a lateral edge extending a preselected lateral dimension outwardly from the sloped surface and downwardly from the upper surface of the strip,

compacting the first strip to a preselected degree of compaction,

shaping the lateral edge of the first strip in an arcuate configuration while simultaneously compacting the strip,

depositing the castable material on the first strip,

spreading the castable material on the previously formed strip outwardly a preselected lateral distance from the sloped surface to form a second strip,

forming a lateral edge of the second strip spaced a preselected lateral distance inwardly of the lateral edge of the first strip and parallel thereto,

shaping the lateral edge of the second strip in an arcuate configuration, and

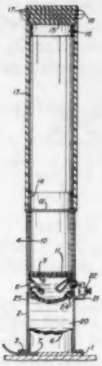
compacting the second strip to a preselected degree of compaction while simultaneously shaping the lateral edge of the second strip to thereby form a step-like configuration of a preselected slope on the sloped surface.

4,167,361

TEMPORARY MINE ROOF PROP

Michael Petro, Coraopolis; Joseph R. Betz, Zelienople, and Duane W. DeArmitt, Butler, all of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Aug. 30, 1978, Ser. No. 938,069
Int. Cl.[2] E21D *15/44*
U.S. Cl. 405—290 **8 Claims**



1. A mine roof prop comprising a base member provided with a closed lower chamber and an adjoining open-top upper chamber, a post slidably mounted in the upper chamber and extending above the base member, means at the upper end of the post for engaging a mine roof, flexible means in the lower chamber supporting a body of liquid, said base member having an air inlet below said flexible means and having a liquid passage connecting the upper part of the lower chamber with the lower part of the upper chamber, and a valve for closing said passage, whereby when compressed air is delivered to said air inlet said flexible means will be moved upwardly to force said liquid through said liquid passage and opened valve into the upper chamber to raise said post, whereupon closing of the valve will trap the liquid in the upper chamber.

4,167,362

MULTIPLE TOOL DRIVING TURRET ATTACHMENT

Otto E. Dietrich, 617 W. Jackson St., Morton, Ill. 61550

Continuation-in-part of Ser. No. 787,913, Apr. 15, 1977, abandoned. This application Mar. 22, 1978, Ser. No. 889,042
Int. Cl.[2] B23B *39/20*
U.S. Cl. 408—35 **17 Claims**

1. A tool driving attachment of the type including a turret rotatably mounted on a hub, a first keyed shaft rotatably mounted in the hub and a plurality of second keyed shafts mounted for rotation in the turret and for alignment with the first shaft, the improvement comprising:

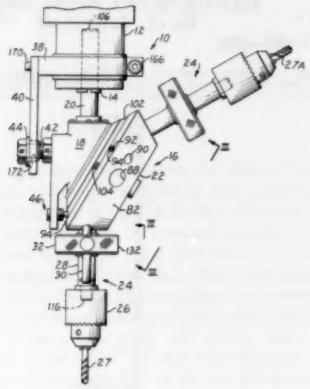
means for guiding each second shaft into and out of engagement with the first shaft, said guiding means being substantially parallel with said second shaft and being attached to one of said turret or said second shaft; and

means for locking said second shaft in rotating engagement with the first shaft and for releasing said second shaft from rotating engagement therewith, said locking means being attached to the other of said turret or said second shaft and being connected for locking and releasing engagement with said guiding means.

17. A tool driving apparatus comprising:

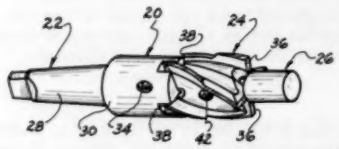
a hub;

a turret rotatably mounted on the hub;
a first keyed shaft rotatably mounted in the hub;
a plurality of second keyed shafts mounted for rotation in the turret and for alignment with the first shaft;
means for guiding each second shaft into and out of engagement with the first shaft, said guiding means being substantially parallel with said second shaft and being attached to one of said turret or said second shaft; and



means for locking said second shaft in rotating engagement with the first shaft and for releasing said second shaft from rotating engagement therewith, said locking means being attached to the other of said turret or said second shaft and being connected for locking and releasing engagement with said guiding means.

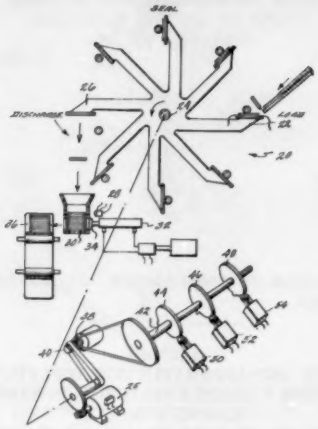
4,167,363
COUNTERBORE CUTTING TOOL
Lowell E. Whitesel, 506 Enfield Rd., Columbus, Ohio 43209
Filed Jun. 3, 1977, Ser. No. 803,160
Int. Cl.[2] B23B *51/00*
U.S. Cl. 408—201 **4 Claims**



1. In a counterbore cutting tool and combination of a separate shank driver portion, a separate cutting head portion, and a pilot portion removably mounted together to form an assembly, said cutting head portion including a set of counterbore cutting teeth on each opposing end, each of said cutting teeth of said sets having an opposing tooth on the other end having a common flute possessing the same geometry when disposed in reverse position in said assembly.

4,167,364
CHEESE WRAPPING AND STACKING MACHINE
Steve Swanlund, Rochester, Minn., assignor to The Kroger Company, Cincinnati, Ohio
Filed Jan. 3, 1978, Ser. No. 866,353
Int. Cl.[2] B65G *57/03*
U.S. Cl. 414—46 **4 Claims**

1. In a machine for forming stacks of individually wrapped slices of cheese having means for delivering said slices to a discharge assembly, one atop the next to form a stack,
means for driving said delivering means and said discharge assembly,
a cam shaft coupled to said driving means and mounting a plurality of cams,
a plurality of cam switches mounted adjacent said cams for operation by said cams, and
control means for causing operation of said discharge assembly as said switches are operated to cause discharge of said stacks, the improvement comprising:

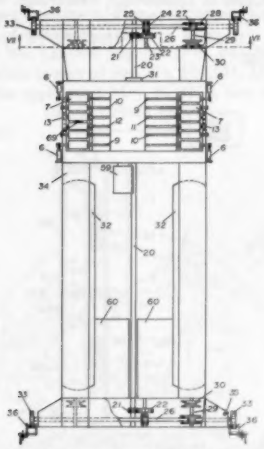


an electrically operated clutch between said cam shaft and said driving means,
an electro-optical sensor mounted for sensing each slice delivered to said discharge assembly,
an electric counter connected to said sensor for accumulating a count indicating the slices stacked since the last discharge, and
means for operating said clutch to cause said discharge assembly to operate upon a given count in said counter to discharge the stack.

4,167,365
CAR PARKING SYSTEM
Spiridon Constantinescu, 161 Violet Dr., Stoney Creek, Ontario, Canada
Filed Aug. 22, 1977, Ser. No. 826,918
Int. Cl.[2] E04H *6/22, 6/24*
U.S. Cl. 414—239 **6 Claims**

1. A parking system for cars, comprising in combination a spatial structure having a plurality of parking shelves disposed horizontally and vertically on both sides of a central zone of vertical movement; an entrance-exit path at the ground in said central zone of vertical movement; a central basement beneath said entrance-exit path; two pairs of vertical racks, each rack extending in the corners of each well formed by a pair of carriers tiers of said parking shelves; a plurality of vehicles each for supporting one car and carrying it from said entrance-exit path vertically and horizontally to appointed said parking shelves and vice versa; a pair of horizontal extensible rails in each of said parking shelves, the extensible parts of said extensible rails on both sides at the same level extending into the central zone when said carrier has arrived at its parking level or when said carrier leaves its said parking shelf; a coupling device having a plurality of friction coated rollers connected in pairs by shafts and arranged on a platform of said vehicle for meshing with the pair of propelling wheels of a car; a switch between said friction coated rollers for starting a clock mechanism when said switch is pressed by a wheel of the car; said clock mechanism working only when its starter is pressed and returning at zero when its starter is free; said clock mechanism activating ram means after an appointed number of seconds of

working; said ram means when activated push up said friction coated rollers which raise settling around the propelling wheels of the car making a couple with them; four pinions connected in pairs by shafts at each end of said carrier meshing each one with one of said vertical racks; four rollers provided in pairs at each end of said carrier for its movement on said horizontal extensible rails; a first driving gear means on said carrier for rotating simultaneously said four pinions and said four rollers performing subsequently the vertical and horizontal movement of said carrier; driving means and a second driving gear means in said parking shelves for moving the said horizontal extensible rails; a mobile rack on each of said vertical racks at each level of said parking shelves for performing a discontinuity on said vertical racks when said carrier has arrived at its parking level and said horizontal extensible rails are extended or when said carrier quitting said parking shelf moves towards central zone on said horizontal extensible rails to reach its said well for lowering to the ground, and for performing the continuity of said vertical racks when said carrier has reached its parking shelf and said horizontal extensible rails are retracted or when said carrier has reached its well from its parking shelf for lowering to the ground; a first series of pinions on said shafts of said coupling device meshing with a second series of idler pinions arranged in the interval of said first series of pinions one of them meshing with a third driving gear means for connecting said shafts of said coupling device with said first driving gear means; a brake mounted on said carrier connecting said third driving gear means for fixing said friction coated rollers when the car moves about on said platform of said carrier; one or two receptacles of compressed air on each of said carrier for activating said rams and said brake; said receptacles are fed from a fixed compressed air system of said spatial structure when said carrier is in its parking shelf; one or two batteries on each of said carrier for activating said switch, light signals and an electric motor when it is set on said carrier; said batteries are fed from a fixed equipment of said spatial structure when said carrier is in its parking shelf.



4,167,366

REFUSE CONTAINER TRANSPORT

Mario De Vivo, One Rowayton Woods Dr., Apt. #1, South Norwalk, Conn. 06854

Filed Oct. 12, 1977, Ser. No. 841,590
Int. Cl.[2] B60P *1/48*
U.S. Cl. 414—697 **23 Claims**

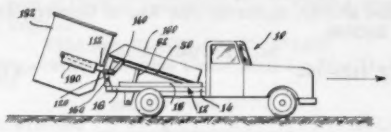
1. A vehicle for providing refuse container movement and alternative utility comprising:

(a) a vehicle having a chassis;

(b) said chassis having relatively forward and rearward positioned segments thereof;

(c) an elongated lifting frame supported by said chassis;

(d) said lifting frame having relatively forward and rearward positioned segments thereof;



(e) means for elevating said rearward frame segment with respect to said rearward chassis segment;

(f) first and second refuse container engaging arms supported by said lifting frame rear segment for movement therewith; and,

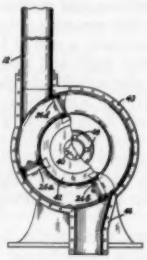
(g) a utility vehicle body mounted on said lifting frame.

4,167,367

IMPACT TURBINE

Bernard Van Mechelen, 704 Bertsch Ave., Crescent City, Calif. 95531

Filed Sep. 12, 1977, Ser. No. 832,632
Int. Cl.[2] F01D *17/14*
U.S. Cl. 415—92 **5 Claims**



1. A water driven electrical power generating system comprising, in combination,

(a) a downwardly extending water intake member adapted to receive water at its upper end,

(b) segmental intake valve means, disposed across said intake member and including segments which are operable through a small angle between a position in which the downward passage of water is completely blocked and a position in which the downward passage of water is freely permitted,

(c) a turbine body having a fixed outer circular wall and a rotary inner circular wall, the inner and outer circular walls jointly bounding an annular space,

(d) a rotary output generator shaft on which the inner circular wall is made fast;

(e) a series of traveling pistons affixed at uniformly spaced intervals to the inner circular wall and necessarily rotatable in unison with the inner circular wall in the annular space between the rotatable inner and the stationary outer circular walls,

(f) an output shaft driven by the pistons through the inner circular wall, and

(g) means operable by the piston driven shaft periodically to open and to close the upper end of the water admission member.

4,167,368

ADVANCE DIFFUSER APPARATUS FOR A BLOWER HAVING A LARGE IMPELLER DIAMETER

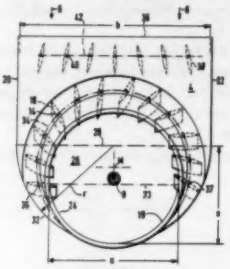
Helmut Brobeck, Hessheim, Fed. Rep. of Germany, assignor to Aktiengesellschaft Kühnle, Kopp & Kausch, Frankenthal, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,239

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1976, 2633480

Int. Cl.[2] F04D *29/56*

U.S. Cl. 415—162 **5 Claims**



1. An advance diffuser for an axial blower having an impeller received in a substantially circular housing and an axis extending in a given direction, comprising a suction box formed with an intake opening through which a medium is drawable by suction in a direction substantially perpendicular to the given direction of the blower axis, a plurality of swirl vanes mounted on shafts in said suction box, said suction box having a pair of mutually opposing parallel walls wherein said shafts are rotatably mounted, a pair of housing walls mutually connecting said parallel walls and tangentially merging with and surrounding the substantially circular outline of the impeller housing, said suction box having another wall facing toward the impeller and formed with a circular suction opening, said shafts whereon said swirl vanes are respectively mounted being contained by a circular arc surrounding part of said suction opening, said arc having end points mutually connectible by a secant extending through said circular suction opening.

4,167,369

IMPELLER BLADING OF A CENTRIFUGAL COMPRESSOR

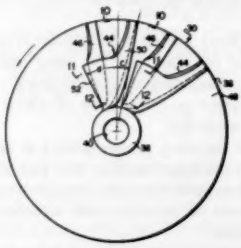
Takeshi Ishihara, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 6, 1977, Ser. No. 840,042

Claims priority, application Japan, Apr. 4, 1977, 52-37643

Int. Cl.[2] F04D *17/10*

U.S. Cl. 416—185 **5 Claims**



1. An impeller for a centrifugal compressor comprising, in combination, a disc having a hub portion and a plurality of blades fixedly mounted at angularly spaced locations on a front face of the disc, each blade integrally comprising an impeller portion extending substantially radially of the disc and a centrally located inducer portion on the front side of the impeller portion, the angle between the impeller portion of each blade and the front face of the disc being about 90 degrees at the inner end of the impeller portion and gradually decreasing toward the outer end thereof at which the angle therebetween is in the range of from about 50 to 70 degrees, the impeller portion of each blade being thus mostly inclined forwardly with respect to the direction of rotation of the disc, the inducer portion of each blade being further inclined forwardly from the impeller portion with respect to the direction of rotation of the disc.

4,167,370

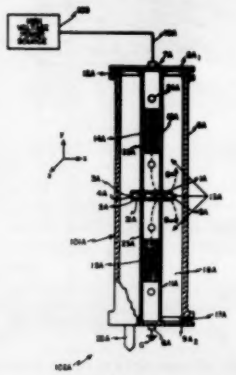
METHOD OF AN APPARATUS FOR SELF-SUSTAINING HIGH VACUUM IN A HIGH VOLTAGE ENVIRONMENT

Peter Graneau, Concord; Michael B. Silevitch, Brookline, and Elizabeth E. Ames, Bedford, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 1, 1976, Ser. No. 737,876

Int. Cl.[2] F04B *37/00*; **H01J** *17/14, 61/26*

U.S. Cl. 417—48 **8 Claims**



1. In combination with a device powered by a high voltage having a predetermined pulsating frequency and electrodes spaced by a gap within which an electric field may be established, an enclosure, and means sealing the enclosure in enclosing relation to the powered device for operation thereof under vacuum conditions, the improvement residing in vacuum-sustaining means for preventing degradation of the vacuum conditions in the enclosure, including means connecting the powered device to the electrodes for generating said electric field at said pulsating frequency to form an electron plasma, and magnetic means establishing a magnetic field in said gap for concentrating the electron plasma in the region of the electrodes, whereby a resulting ion-pumping effect maintains the vacuum conditions in the enclosure, said magnetic means comprising at least one permanent magnet enclosed within one of the electrodes adjacent to the gap.

4,167,371

METHOD OF FLUID PRESSURIZATION

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Filed Sep. 6, 1977, Ser. No. 825,701

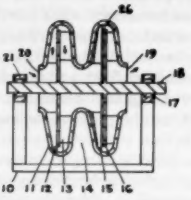
Int. Cl.[2] F04B *41/00*

U.S. Cl. 417—53 **2 Claims**

1. A method of heat exchange and fluid pressurization comprising:

a. alternately compressing and expanding a compressible fluid in a plurality of compression-expansion steps and simultaneously adding heat into said fluid during the pas-

sage of said fluid through the compression-expansion steps;



b. causing the temperature of said fluid to increase from step-to-step during the passage of the fluid within the plurality of said compression-expansion steps.

4,167,372

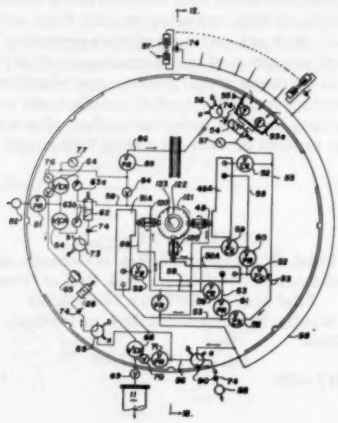
INTEGRATED ENERGY SYSTEM

Louis E. Tackett, Grandview, Tex., assignor to Unep 3 Energy Systems, Inc., Grandview, Tex.

Division of Ser. No. 728,064, Sep. 30, 1976, Pat. No. 4,118,637, and a continuation-in-part of Ser. No. 579,131, May 20, 1975, abandoned. This application May 24, 1978, Ser. No. 908,998

Int. Cl.[2] F04B *23/04*

U.S. Cl. 417—62 **6 Claims**



5. For use in an energy collecting, storage and distribution system in which compressed air is employed as a medium for storage of energy and employed to drive generators for generating electricity, a wind turbine driven air compressor station comprising, in combination, a base, a central vertical tubular column projecting upwardly from said base, a turbine blade support frame mounted for rotation about the vertical axis of said central column, a plurality of elongaged vertically extending turbine blades mounted on said support frame at spaced intervals therearound and being disposed in position to be driven by wind to rotate said support frame about said central column, said support frame including an elongated tubular hub shaft journaled for rotation about the axis of said column and projecting downwardly below said turbine blades, air compressor means drivingly connected to said tubular shaft, said compressor means including a plurality of separate compressor stages, pressure sensing means for sensing the discharge pressure of each separate compressor stage and control means responsive to said pressure sensing means and operatively innerconnecting said compressor stages for automatically delivering low, intermediate or high pressure air at inversely varying flow rates for use in the energy collecting, storing and distributing system and in response to the pressure in the system, and brake means responsive to the air pressure in the system for limiting rotation speed of said turbine support frame.

4,167,373

FUEL INJECTION PUMPING APPARATUS

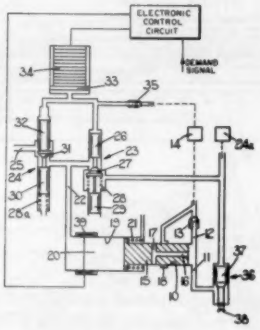
Boaz A. Jarrett, Sevenoaks, and Paul Lakra, Wembley HAO IBL, both of England, assignors to C.A.V. Limited, Birmingham, England

Filed Apr. 30, 1974, Ser. No. 471,688

Claims priority, application United Kingdom, May 11, 1973, 22475/73

Int. Cl.[2] F04B *49/00*

U.S. Cl. 417—289 **10 Claims**



1. A fuel injection pumping apparatus comprising in combination, a displacement piston located within a cylinder, an outlet and a fuel inlet at one end of the cylinder, a one-way valve in said fuel inlet for permitting fuel to flow only into said inlet, a fluid pressure operable member mounted within a further cylinder for actuating said piston and causing fuel to be delivered through said outlet, means operable upon movement of the piston to a predetermined position in said cylinder during delivery of fuel through said outlet by the piston, to terminate flow of fuel through said outlet, valve means operable to place an end of said further cylinder in communication with a source of fluid under pressure to effect movement of the displacement piston in a direction to deliver fuel through said outlet, or with a drain to permit return motion of the piston, the apparatus including means controlling the operation of said valve means, a control circuit operable to control the means controlling operation of said valve means, and sensing coil means positioned to sense the position of the fluid pressure operable member mounted within said further cylinder to provide a signal to the control circuit indicative of the position of the displacement piston, the extent of the return motion of the displacement piston being controlled to determine the quantity of fuel discharged through said outlet during movement of the piston by said fluid pressure operable member.

4,167,374

PUMP AND VALVE ARRANGEMENT

Thomas H. Smith, 17 Oakcrest Dr., Laurel, Miss. 39440

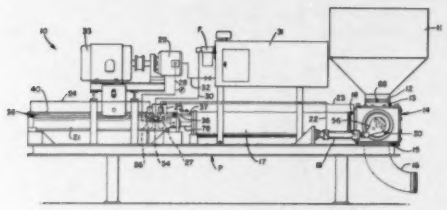
Filed Sep. 13, 1977, Ser. No. 832,821

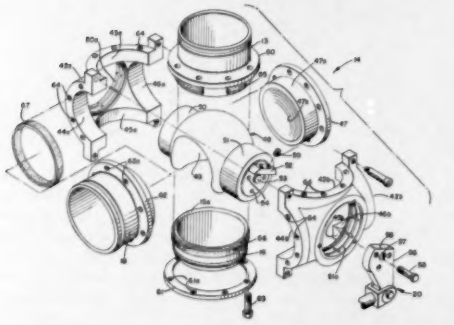
Int. Cl.[2] F04B *9/00, 15/02*

U.S. Cl. 417—318 **7 Claims**

1. A pump and valve combination, comprising: a source of material to be pumped; a rotary valve means having an inlet connected with said source and an outlet connected with an outlet conduit extending to a remote location, said inlet and outlet axially aligned with one another on top and bottom sides, respectively, of said valve means; a reciprocating pump means connected with said valve means at one side thereof, between the inlet and outlet; said valve means having a cleaning opening in the other side thereof opposite said pump; a

removable closure closing said cleaning opening; said valve means including a housing with a rotatable closure member therein, said closure member having a journal extended through one side of the housing, a removable crank on said journal; said valve housing comprising two substantially identical parts releasably secured together, each of said parts having cutouts therein which mate with corresponding cutouts in the other part to define openings, seat sleeves extended from exteriorly of the housing through the openings into engagement with the closure member, seal means sealing the seat sleeves relative to the housing, and means releasably securing





the seat sleeves to the housing; valve motor means connected with the crank for rotating the closure member between a first position establishing communication between the source and the pump, and a second position rotated 90 degrees from the first position establishing communication between the pump and the outlet; pump motor means connected with the pump to reciprocate the pump to alternately draw material from the source, through the valve means and into the pump and to then expel the material from the pump, through the valve means and to the remote location; and control means connected with each said motor means to operate the motor means in synchronism to obtain desired control over flow of the material.

4,167,375

POWER-CONVERTING DEVICE

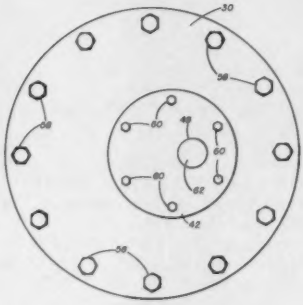
Niranjan K. Doshi, Mehlville, Mo., assignor to Frank Apostol, East St. Louis, Ill.

Continuation-in-part of Ser. No. 684,537, May 10, 1976, Pat. No. 4,061,445. This application Oct. 27, 1977, Ser. No. 845,882

Int. Cl.[2] F01C *1/02, 19/04, 21/00*

U.S. Cl. 418—54 **13 Claims**

1. A power-converting device that comprises a chamber which has a generally-cylindrical inner wall, a generally-elliptical rotor which is disposed within said chamber and which has a major axis and a minor axis, a shaft, a first reciprocation-permitting surface on said shaft, a second reciprocation-permitting surface that is on said rotor and that rotates whenever said rotor rotates, said first and said second reciprocation-permitting surfaces being in engagement with each other to force said shaft and said rotor to rotate together, said reciprocation-permitting surfaces permitting relative reciprocal movement therebetween so said rotor can reciprocate along said major axis as it rotates within said chamber, a plurality of seals that are mounted on said rotor and that engage said inner wall of said chamber but permit rotation and reciprocation of said rotor relative to said chamber while providing a sealing action between said rotor and said inner wall of said chamber, an inlet port of said chamber which admits fluid, an outlet port of said chamber which exhausts fluid, and interacting surfaces which restrain said rotor against continued momentum-induced movement as said rotor approaches an end of its path of recip-



rocation along said major axis, said interacting surfaces being radially displaced from and being separate from, and in addition to, said shaft and said reciprocation-permitting surfaces, the areas of interaction of said interacting surfaces being displaced from the center of said chamber, one of said interacting surfaces being a non-linear track-like surface and another of said interacting surfaces being the surface of a roller, said interacting surfaces providing a rolling engagement therebetween.

4,167,376

AXIAL FAN

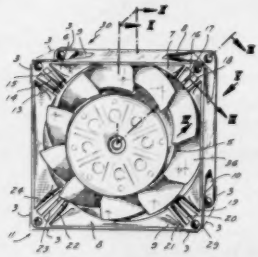
Hermann Papst, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren KG, St. Georgen, Fed. Rep. of Germany

Filed May 20, 1977, Ser. No. 798,924

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1976, 2652642

Int. Cl.[2] F04B *35/04*

U.S. Cl. 417—354 **10 Claims**



1. An axial fan comprising, in combination, a fan housing having a generally circular inner peripheral contour and provided with a plurality of substantially identical equally spaced radial projections and having at each axial end of the housing a boundary surface and including a tubular part extending in the axial direction of the fan housing intermediate the two boundary surfaces, a drive motor and radial spokes mounting the drive motor centrally at the boundary surface at one axial end of the housing, a fan wheel driven by the motor and at least partly surrounding the motor and provided with fan blades

accommodated in an annular flow channel defined intermediate the tubular part and the drive motor, the fan blades extending substantially all the way to the other axial end of the tubular part of the fan housing, the tubular part approximately midway between its axial ends having a circular interior cross-section closely surrounding the outer peripheral boundary surface of the fan blades, the radial projections being located at at least one of the two axial ends of the fan and the tubular part merging into the radial projections, the inner wall of the tubular part in the vicinity of the radial projections being set back radially outward from the outer peripheral boundary surface of the fan blades but being confined within the outer boundary surface of the fan housing, and further including stationary flow-guiding ribs provided on the set back parts of the tubular part of the fan housing and located in their entirety radially outward of the outer peripheral boundary surface of the fan wheel.

4,167,377

POWDER ROLLING APPARATUS

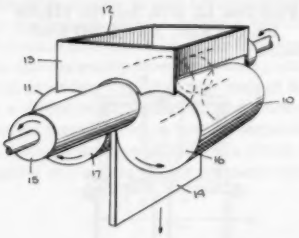
Samuel T. Oakley, Stourbridge, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Jul. 21, 1978, Ser. No. 926,863

Claims priority, application United Kingdom, Jul. 29, 1977, 31986/77; Oct. 3, 1977, 40998/77

Int. Cl.[2] B22F *3/18*

U.S. Cl. 425—79 **10 Claims**



1. In apparatus for compacting metal powders comprising a pair of generally cylindrical rolls of equal length mounted for rotation about respective parallel spaced roll axes to define a roll gap therebetween, means for feeding metal powder to an intake side of the roll gap along the entire length of the rolls to be compacted to a strip-like product of width equal to the roll length, and edge-restraint means at opposite axial extremities of the rolls effective to prevent powder egress from the roll gap in a direction parallel to the roll axes,

the improvement wherein each edge restraint means comprises a restraint member consisting of a cylindrical block of smaller diameter than each roll, rotatably mounted about an axis which is parallel to the roll axes and spaced therefrom, means for urging each restraint member so as to cause portions of an end-face thereof to contact a portion of an end-face of each of the rolls adjacent the intake side of the roll gap, and driving means connected to each restraint member and effective to impart rotation thereto, thereby producing relative sliding motion between the end-face of the restraint member and the respective end-faces of the rolls.

4,167,378

APPARATUS FOR SHREDDING AND DRY-DEFIBRATING COMPRESSED CELLULOSE PULP AND FORMING A BATT OF THE RESULTING CELLULOSIC FIBROUS MATERIAL

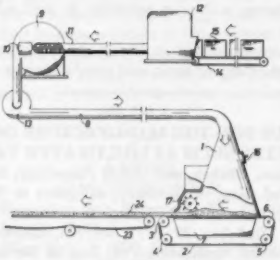
Per B. Hagg, Ornskoldsvik; Sven I. Bergstrom, Bjasta; Lars E. Lundmark, Jarved, and Carl-Erik L. Hedberg, Ornskoldsvik, all of Sweden, assignors to Mo och Domsjo AB, Ornskoldsvik, Sweden

Filed Feb. 4, 1977, Ser. No. 765,508

Claims priority, application Sweden, Feb. 6, 1976, 7601328; Sep. 10, 1976, 7610047

Int. Cl.[2] B29C *13/00*; B29D *7/00*

U.S. Cl. 425—82.1 **18 Claims**



1. Apparatus for preparing batts of relatively uniform density from shredded, defibrated cellulose pulp material, which comprises, in combination, a dry-pulp shredder; a dry pulp defibrator; means for feeding at a selected rate dry-shredded dry-defibrated cellulose pulp material to a foraminous support, and depositing the material on the support to form a batt; milling means for removing cellulose pulp fibers from the surface of the batt; sensing means for determining the loading on the milling means while fibrous material is being thus removed; control means responsive to a sensed load below a predetermined minimum, to increase the rate of feed of shredded defibrated cellulose pulp material, and to a sensed load above a predetermined maximum, to decrease the rate of feed of shredded defibrated cellulose pulp material; and means for drawing off the resulting fibrous batt material.

4,167,379

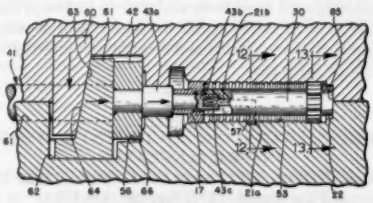
INJECTION MOLD

James P. Liautaud, Cary, Ill., assignor to American Antenna Corporation, Elgin, Ill.

Division of Ser. No. 736,323, Oct. 28, 1976, Pat. No. 4,075,273. This application Nov. 2, 1977, Ser. No. 847,948

Int. Cl.[2] B29F *1/10*

U.S. Cl. 425—111 **5 Claims**



1. Apparatus for molding a coil form of the type having a cylindrical core member, at least one end fitting at one of the ends of the core member, and a thin plastic over-layer on the core member forming a precision winding support surface having a selected length, comprising, in combination:

a mold loading jig for supporting said core member with said at least one end fitting attached in axial alignment to said core member at one of the ends thereof,

said core member and at least one end fitting forming a core assembly having a length greater than said selected length,

a mold including a cavity having an inside surface corresponding to said winding support surface,

registration means cooperatively associated with said mold for receiving said mold loading jig and core assembly, said registration means comprising a first registration surface in said cavity axially abutting said core assembly and a second registration surface spatially fixed with respect to said first registration surface, said mold loading jig being movable along the axis of said core assembly into abutment with said second registration surface,

compression means for moving said mold loading jig into abutment with said second registration surface, thereby compressing said core assembly to said selected length, and

injection means in said mold for channeling molten plastic into said cavity to form said winding support layer.

4,167,380

APPARATUS FOR THE MANUFACTURE OF LAYERED ARTICLES SUCH AS MULTILAYER TABLETS

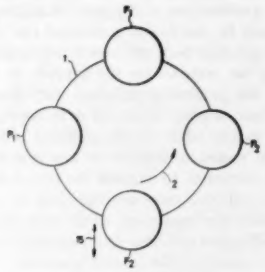
Werner Stüben, Büchen, and Ulrich Zeuschner, Schwarzenbek, both of Fed. Rep. of Germany, assignors to Wilhelm Fette GmbH, Schwarzenbek, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,964

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639090

Int. Cl.[2] B29D *31/00*

U.S. Cl. 425—134 **10 Claims**



1. Apparatus for making multilayer articles, particularly tablets, comprising a succession of dies supported for movement along a predetermined path; at least two feeding devices arranged along said path in an operative position in which they feed material into said dies; at least two compressing devices arranged in said path downstream of respective feeding devices to compress material in said dies; and reciprocating means for moving at least one feeding device into an inoperative position spaced apart from said path to interrupt the feeding of said material and to enable the withdrawal of samples of precompressed material from said dies without interrupting the movement of the latter.

4,167,381

CENTRIFUGAL CASTING EQUIPMENT HAVING AN INTERCHANGEABLE

Lawrence J. Hilmoe, 9419 Caddy La., Caledonia, Wis. 53108

Filed Oct. 4, 1977, Ser. No. 839,171

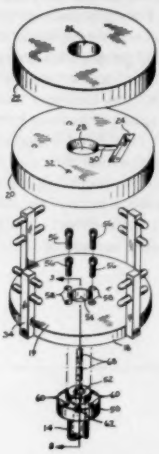
Int. Cl.[2] B29C *5/04*

U.S. Cl. 425—182 **9 Claims**

1. In a centrifugal casting machine having a generally vertical shaft mounted in a frame, rotary drive means coupled to said shaft for rotating same, and head for receiving a casting mold mounted on said shaft along the axis thereof for being rotated by said shaft, the improvement comprising:

a collar on the upper end of said shaft having a flange extending thereabove co-axial with said shaft;

said head having an opening in the central portion thereof for receiving said flange when said head is placed on said shaft so that said head abuts said collar;



fastener means for fixing said head to said collar; and

a key received in said collar and head and extending therebetween for preventing relative rotation between said collar and head.

4,167,382

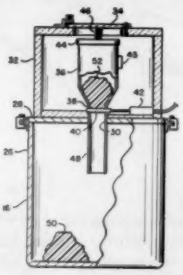
APPARATUS FOR ROTO-MOLDING

Frank J. Freedman, Penfield, and Warren D. Fishbaugh, Rochester, both of N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,498

Int. Cl.[2] B29C *5/04*; B29D *9/08*

U.S. Cl. 425—256 **9 Claims**



1. Roto-molding apparatus comprising:

(a) a hollow mold body of heat conducting material for receiving a charge of powdered resin to be roto-molded, said mold body having a removable cover with an opening therethrough;

(b) a heat insulated compartment attached to the exterior of said mold cover, said compartment having an insulated base, upstanding side walls and top;

(c) an upright dispenser for powdered resin fixed in said insulated compartment, said dispenser being in communication with the interior of said mold body through said compartment base and said opening;

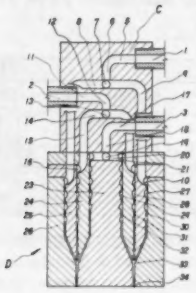
(d) seal means for selectively opening and closing the communication between said dispenser and the interior of said mold body; and

(e) load means for loading a charge of powdered resin into said dispenser.

4,167,383
MULTI-RING DIE

Kenkichi Murakami, Osaka, and Yoshiharu Kikuzawa, Takarazuka, both of Japan, assignors to Kabushiki Kaisha Plastic Kogaku Kenkyusho, Osaka, Japan

Filed Dec. 5, 1977, Ser. No. 857,710
Claims priority, application Japan, Dec. 3, 1976, 51/145913
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—462 6 Claims

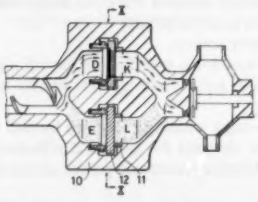


1. A multi-ring die for extruding a tube composed of a plurality of layers said multi-ring die comprising a die portion having a core and at least two rings disposed one around another and defining die passages therebetween and a column-like portion having at least two nozzles mounted on the outer periphery thereof and formed with passages communicating with the nozzles for feeding a plurality of plasticized resins into the die passages; each passage in the column-like portion comprising a guide passage extending from the nozzle to a branch point which is formed on the center of the column and a branch passage extending from the branch point to an inlet of the die passage; the guide passage having a bore communicating with the nozzle; the branch passage having a plurality of branch bores each branch bore including a radial bore portion extending radially and outwardly from the branch point and an axial bore portion extending from the outer ends of the radial bore portion in a direction parallel to the longitudinal axis at the column-like portion wherein the bores are separated from each other; and wherein the cross-section of a group of the branch bores branched at a certain branch point are identical to each other.

4,167,384
FILTER SCREEN EXCHANGING APPARATUS FOR PLASTIC EXTRUDER

Toru Shirato; Minoru Yoshida, and Hideki Mizuguchi, all of Hiroshima, Japan, assignors to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Mar. 23, 1978, Ser. No. 889,588
Claims priority, application Japan, Nov. 28, 1977, 52-141572
Int. Cl.[2] B29F *3/02*
U.S. Cl. 425—183 6 Claims



1. A filter screen exchanging device for a plastic resin extruding apparatus having branched resin flow passages, comprising:

(a) a pair of elongated, generally planar slide plates arranged in parallel with each other and individually slidably disposed in associated resin flow passages transverse to the resin flow direction,

(b) a through-hole in one half of each slide plate, the other side of each slide plate being solid,

(c) an apertured breaker plate mounted in each through-hole,

(d) a filter screen disposed over each breaker plate on its upstream side,

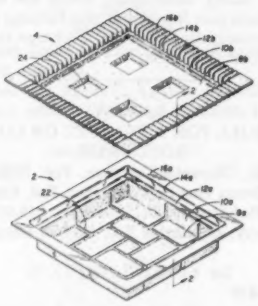
(e) an apertured screen cap overlying each filter screen and removably secured in the respective through-hole to rigidly retain said filter screen in place, and

(f) means for selectively transferring each slide plate between a first postion whereat its filter screen is disposed in the associated resin flow passage and a second position whereat its filter screen is exposed for removal and replacement and its solid side blocks its associated resin flow passage.

4,167,385
CONCRETE MOLD

Frank E. DeRezendes, San Ramon, Calif., assignor to J. M. Leaver, Lafayette, Calif.

Filed Feb. 2, 1978, Ser. No. 874,439
Int. Cl.[2] B28B *3/04*
U.S. Cl. 425—410 15 Claims



1. A mold for forming articles made from a cementitious mixture including water and a binding material, the mold comprising flanged upper and lower members, one member being adapted to be progressively inserted within the other until the respective flanges come into contact for compressing a quantity of cementitious mixture in the cavity between the said members, the flanges of the members having portions on the upper side of one and lower side of the other to define a plurality of channels which extend between the formed cavity and the exterior of the mold when said flanges are in contact whereby excess water from cementitious mixture being compressed between the members can flow through the channels and out of the mold.

4,167,386
EXTRUSION DIE PLATE CONSTRUCTION

John B. Mallay, Houston, Tex., assignor to Muesco-Mallay Houston, Inc., Houston, Tex.

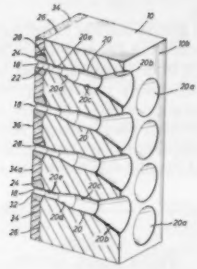
Filed Sep. 26, 1977, Ser. No. 836,318
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—463 9 Claims

1. An extrusion die plate for a pelletizing apparatus comprising:

a die plate body having a die plate face and provided with a plurality of extrusion passageways extending therethrough,

discreet, spaced extrusion port formations positioned on said die plate body, each of said extrusion port formations having a portion protruding outwardly from said die plate face, each of said formations defining an extrusion port which registers with one of the extrusion passageways in said die plate body, said extrusion port terminating at an extrusion orifice,

each of said extrusion port formations, being formed of a unitary body of a machinable material of greater abrasion resistant than the material of said die plate body,



each of said formations having a substantially planar discharge surface surrounding said extrusion orifice, said surfaces being substantially coplanar, and

an abrasion resistant facing being positioned on said die plate face, said facing substantially filling the space between said extrusion port formations, and forming a substantially planar discharge face with said discharge surfaces on said extrusion port formations.

4,167,387

SEGMENT ROLL FOR A BRIQUET OR COMPACTING ROLL PRESS

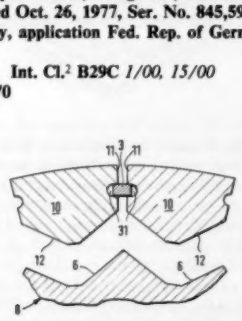
Claus Buchholz, Obersulm-Eschenau, Fed. Rep. of Germany, assignor to Bepex GmbH, Leingarten, Fed. Rep. of Germany

Filed Oct. 26, 1977, Ser. No. 845,597

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1976, 2649801

Int. Cl.[2] **B29C** *1/00, 15/00*

U.S. Cl. 425—470 **8 Claims**



1. In a segmented roll for briquetting and compacting presses comprising separate roll segments, and clamping means firmly holding the segments in side-by-side relationship on the circumference of a roll core, each of said segments defining side walls in face-to-face relationship, the improvement in sealing means for preventing the passage of particles between said faces and between the segments and roll core, said sealing means comprising profiles extending in the direction of the roll axis and positioned between said side walls, grooves formed in the side walls, said grooves extending across the width of said side walls, said segments being held in said grooves, said profiles being formed of ductile metallic material and said profiles being clamped between said side walls when the segments are assembled with the roll core whereby the pressure applied by said clamping means compresses the profiles to provide a sealing relationship between the profiles and the side walls across the width of the side walls, and said profiles being radially spaced from the upper side of the mold segments.

4,167,388

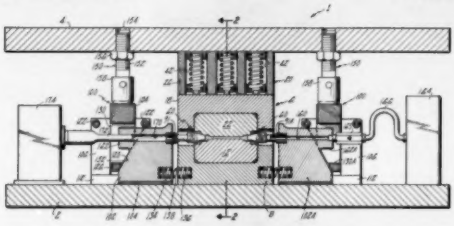
APPARATUS FOR FORMING HOLLOW MEMBERS

John R. Keelor, North Palm Beach, and James L. Williams, Lake Park, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 1, 1978, Ser. No. 901,920

Int. Cl.[2] **B29C** *17/00, 17/04, 17/07*

U.S. Cl. 425—387.1 **9 Claims**



1. An apparatus for forming a hollow member from a preformed hollow member comprising die means for enclosing a preformed hollow member; said die means permitting each end of a preformed hollow member to protrude from said die means; first nozzle means for entering one open protruding end of a preformed hollow member to force it against a mating surface of the die thereby providing a seal; second nozzle means for entering another open protruding end of a preformed hollow member to force it against a mating surface of the die thereby providing a seal; each nozzle means being mounted on a slidable block providing for axial movement of the nozzle means for entry into an open protruding end of a preformed hollow member and for withdrawal therefrom; a source of forming substance; passage means connecting said source of forming substance to said first nozzle means through a one-way check valve; a chamber connected to the end of said second nozzle means; a piston located in said chamber; means for bleeding air from said chamber so that said forming substance can be placed in said passage means, said first nozzle means, a preformed hollow member, said second nozzle means and said chamber when said first and second nozzle means are providing a seal with ends of a preformed hollow member; means for moving said piston in said chamber to increase the pressure of said forming substance for forcing a preformed tubular member into said die means to give it its final form.

4,167,389

OIL BURNER PRIMARY CONTROL FOR INTERRUPTED IGNITION SYSTEM

Donald E. Donnelly, Edwardsville, Ill.; John W. Breig, Crestwood, Mo., and Robert L. Gellner, Belleville, Ill., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 2, 1977, Ser. No. 847,740

Int. Cl.[2] **F23N** *5/08*

U.S. Cl. 431—79 **8 Claims**

1. In a primary control for controlling operation of a fuel burner and an ignition device,

an a.c. power source;

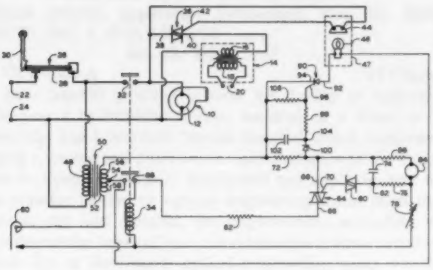
a voltage step-down transformer having a primary winding connected across said power source and a secondary winding;

a relay having a winding energized by said secondary winding upon demand for heat and effective for connecting said fuel furner across said power source to initiate flow of fuel;

circuit means including a controlled solid state ignition switch connected in parallel with said fuel burner and

effective when said ignition switch is conductive for energizing said ignition device to ignite said fuel;

coupling circuit means for controlling conduction of said ignition switch comprising a first portion connected to said secondary winding and a second portion connected in a gating circuit for said ignition switch; and



circuit means including of timing means responsive to a burner flame and adapted to be energized by said secondary winding in the absence of said burner flame for effecting initial energizing of said first portion of said coupling circuit means and for effecting continuing energizing thereof for a predetermined time period beyond the time at which said burner flame appears.

4,167,390

INSTALLATION FOR BURNING MATERIALS

Raoul Borner, Postfach 59, 7320 Sargans, Switzerland

Filed Feb. 4, 1977, Ser. No. 766,065

Int. Cl.[2] F27B *15/00*

U.S. Cl. 432—58 **19 Claims**

1. An assembly for burning crushed raw powder to effect acidifying, sintering or melting minerals in said powder, said assembly comprising:

(a) a closed, elongated furnace chamber,

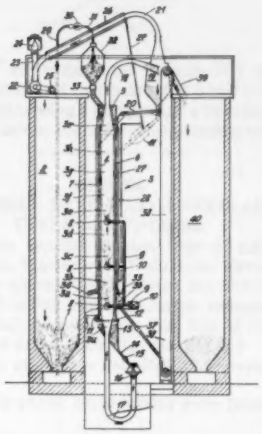
(b) means for establishing a current of gas from one end of the furnace chamber to the other end thereof,

(c) means for maintaining the current of gas at a negative pressure,

(d) means for effecting combustion in at least one zone of said chamber for burning the raw powder to form a burnt reaction product,

(e) means for separating the burnt product from the current of gas under negative pressure, and

(f) means for introducing raw powder into said furnace chamber from a raw powder silo,



(g) said raw powder introducing means including an anterior silo and a suction pipe means for directing raw powder from said raw powder silo into said anterior silo.

4,167,391

DUST TRAP

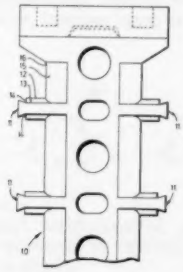
William J. Lovatt, Stoke on Trent, England, assignor to Acme Marls Limited, England

Filed Oct. 12, 1977, Ser. No. 841,455

Claims priority, application United Kingdom, Oct. 15, 1976, 42863/76

Int. Cl.[2] F27D *5/00*

U.S. Cl. 432—258 **3 Claims**



1. A ceramic ware support structure comprising a plurality of upright pillars provided with outwardly extending shelf supports adapted to slidably receive and support at least one horizontally disposed shelf, each shelf support having a flat, generally horizontal supporting surface and defining an upwardly opening dust trap groove located outwardly of and below the supporting surface.

4,167,392

TRANSFER PRINTING PROCESS FOR HYDROPHILIC FIBROUS MATERIAL OR BLENDS OF HYDROPHILIC AND SYNTHETIC FIBROUS MATERIAL, WITH REACTIVE DISPERSE DYES

Raymond Defago, Riehen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Dec. 30, 1975, Ser. No. 645,475

Claims priority, application Switzerland, Dec. 30, 1974, 17365/74; Oct. 3, 1975, 12856/75

Int. Cl.[2] D06P *3/66*

U.S. Cl. 8—2.5 A 17 Claims

1. In a transfer printing process for dyeing or optically brightening a hydrophilic fibrous material or a blend of a hydrophilic and a synthetic fibrous material which comprises bringing a treated and dried carrier into contact with the material to be dyed or optically brightened and applying heat to effect transfer of dye or optical brightening agent from the carrier to the said material, the improvement according to which the carrier bears at least one sublimable organic reactive disperse dye or fluorescent optical brightening agent which, during the heat treatment of the transfer printing process, has a vapour pressure higher than 10^{-5} Torr at temperatures above 160° C. or transfers to an amount of at least 50% onto the said fibrous material during a time period of from 1 to 120 seconds and wherein, prior to the heat transfer step, the fibrous material to be printed is pretreated with

(a) at least two compounds which are inert to the dyes, brighteners and fibrous material during the transfer, the first one of which has a boiling point higher than 120° C. and a solubility or dispersibility in water, either directly or with the aid of an auxiliary solvent or dispersant, of at least 25 g/l at 25° C. and which, under the conditions of transfer of the dyes or fluorescent brighteners is sparingly volatile, said first compound being selected from the group consisting of 2,6-dihydroxytoluene, resorcinol, glutaric anhydride, succinic anhydride, hydroquinone-bis-hydroxyethyl ether, butanediol glycidyl ether and methoxypolyethylene glycol, the other compound being an organic or inorganic acid acceptor, or

(b) at least one compound inert to the dyes, brighteners and fibrous material during the transfer and which possesses the characteristics of both of the compounds under (a), and selected from the group consisting of amines, amides, imides, imines, unsubstituted and substituted ureas and thioureas or 5- to 7-membered saturated or unsaturated heterocyclic ring compounds which contain as ring members at least one of the groups or atoms N, S, O, NH, CO, =CH, CH_2 and which can be substituted by alkyl of 1 to 4 carbon atoms, OH, NH_2, hydroxyalkyl of 1 to 3 carbon atoms or halogen, said treated fibrous material being dried prior to contacting with the treated carrier.

4,167,393

METHOD FOR BINDING A WATER-SOLUBLE DIRECT DYE TO PAPER

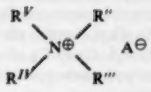
Anthony M. de Roo, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 21, 1978, Ser. No. 935,426

Int. Cl.[2] D21H *1/46;* D06P *1/52;* C08G *73/02, 73/04*

U.S. Cl. 8—7 8 Claims

1. In a method of binding a water-soluble, direct dye to paper using a binder, the improvement wherein the binder is the reaction product of a polyalkylene polyamine having a number average molecular weight of at least about 10,000 and between about 0.1 and about 0.75 equivalent weights of a quaternary ammonium salt of the formula



wherein R''-R^{IV} are hydrocarbyl radicals of 1 to 3 carbon atoms, R^V is a substituted hydrocarbyl of 3 to 5 carbon atoms with the substituents being a halogen and a hydroxyl group on adjacent carbon atoms, and $A\theta$ is a neutralizing anion.

4,167,394

UNIFORMLY DYED WATER-SWELLABLE CELLULOSIC FIBERS

Johannes Dehnert; Guenter Hansen, both of Ludwigshafen; Hermann Kaack, Wachenheim; Wolf-Dieter Kermer, Fussgoenheim; Walter Kurtz, Bad Durkheim, and Ernst Schaffner, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

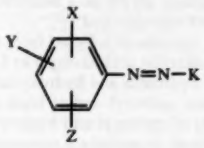
Filed Jan. 9, 1978, Ser. No. 868,213

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1977, 2702371

Int. Cl.[2] C09B *29/36, 29/38;* D06M *1/00;* D06P *1/04*

U.S. Cl. 8—41 R 5 Claims

1. Uniformly dyed water-swellable cellulosic fibers, said fibers being fast to washing, dry cleaning, sublimation and light wherein said fibers are dyed with at least one essentially water-insoluble dye of the formula

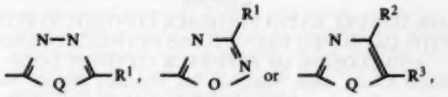


in which

X is hydrogen, chlorine, bromine, cyano, nitro, C_1 to C_4 alkylsulfonyl, phenylsulfonyl, methoxy or ethoxy,

Y is hydrogen, chlorine, bromine, cyano or nitro,

Z is



Q is oxygen or sulfur,

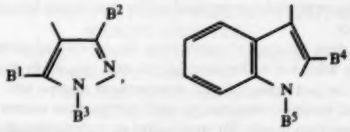
R^1 is C_1 to C_4 alkyl, methoxymethyl, phenoxymethyl, phenyl or phenyl substituted by chlorine, bromine, nitro, methyl, methoxy or ethoxy,

R^2 is hydrogen, methyl, ethyl, phenyl or phenyl substituted by chlorine, bromine or methyl,

R^3 is hydrogen, methyl or, if R^2 is methyl, is C_1 to C_4 alkoxycarbonyl,

R^2 and R^3 together with the linking carbon atoms are phenylene or phenylene substituted by chlorine, methyl, methoxy or ethoxy,

K is



B^1 is hydroxy or amino,

B^2 is hydrogen, methyl, carboxyl, C_1 to C_4 alkoxycarbonyl, carbamoyl, carbamoyl mono- or disubstituted on the nitrogen by C_1 to C_8 alkyl, benzyl, phenylethyl, cyclohexyl, phenyl, methylphenyl, C_1 to C_8 alkoxy-C_2 to C_4-alkyl or phenoxyethoxypropyl, carbopyrrolidide, carbopiperidide or carbomorpholide,

B^3 is hydrogen, C_1 to C_8 alkyl, cyclohexyl, benzyl, phenylethyl, phenylpropyl, phenyl, phenyl substituted by chlorine, bromine, methyl, ethyl or nitro, or naphthyl,

B^4 is hydrogen, methyl or phenyl,

B^5 is hydrogen or methyl.

4,167,395

WATER-SOLUBLE BRANCHED POLYESTERS

Friedrich Engelhardt; Karl Hintermeier, both of Frankfurt; Joachim Ribka, Offenbach-Burgel, and Helmut Beutler, Kelkheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt Fechenheim, Fed. Rep. of Germany

Filed May 12, 1977, Ser. No. 796,152

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621653

Int. Cl.[2] **C08G** *63/66, 63/68*

U.S. Cl. 8—173 **11 Claims**

1. A water-soluble polyester having an apparent molecular weight of from about 600 to about 5,000 which is the esterification reaction product of

(a) dicarboxylic acid;

(b) diol comprising at least 40 mole percent of diethylene glycol, triethylene glycol or a mixture thereof based on the total —OH reactant; and

(c) a branching component selected from the group consisting of polycarboxylic acid having 3 to 5 carboxyls, polyol having 3 to 5 hydroxyls and hydroxycarboxylic acid having at least one carboxyl and at least one hydroxyl and having a total of carboxyl and hydroxyl of 3 to 5 in an amount sufficient to produce a polyester having 5 to 40 mole percent branching component;

with the proviso that the polyester also contains 5 to 40 mole percent of $—SO_3M$ based on the molar amount of total esterified carboxylic acid and wherein M is a cation of an alkali metal, an organic amine or ammonium.

4,167,396

AIR-TO-FUEL RATIO FEEDBACK CONTROL SYSTEM WITH IMPROVED TRANSITIONS BETWEEN OPENING AND CLOSING OF FEEDBACK CONTROL LOOP

Toshio Kondo, Anjo; Nobuyuki Ito, Hekinan; Hideaki Norimatsu, Kariya, and Nobuyuki Kobayashi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 7, 1977, Ser. No. 831,290

Claims priority, application Japan, Sep. 23, 1976, 51/114212

Int. Cl.[2] **F02B** *3/00, 75/10*

U.S. Cl. 123—32 EE **4 Claims**

1. An air-to-fuel ratio feedback control system for internal combustion engines comprising:

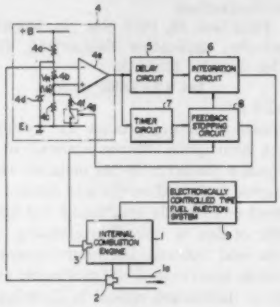
detection means for detecting the air-to-fuel ratio of a mixture supplied to an engine in response to oxygen concentration in exhaust gases of the engine to produce a signal representing the air-to-fuel ratio thereof;

comparison means for comparing the air-to-fuel ratio representing signal of said detection means with a reference value preset to correspond to the stoichiometric air-to-fuel ratio;

correction means for correcting the air-to-fuel ratio of mixture which is to be supplied to said engine in response to the output value of said comparison means; and

control means connected to said comparison means and said correction means for producing an output signal where an output level of said comparison means is kept unchanged during a predetermined period of time, the output signal of said control means preventing the correcting operation of said correction means;

said comparison means including means, connected to said control means, for varying, in response to the output



signal of said control means, the reference value of said comparison means to a predetermined level which increases the difference from the air-to-fuel ratio representing signal of said detector means.

4,167,397

COAL DESULFURIZATION

Stephen L. Grant, Stow, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Mar. 31, 1978, Ser. No. 891,960

Int. Cl.[2] **C10L** *9/10;* **C10B** *57/00*

U.S. Cl. 44—1 R **8 Claims**

1. A process for removing pyritic sulfur from coal comprising

(1) contacting particulate coal with an aqueous treating solution comprising an aqueous solution containing salt of a Group I or II metal, said treating solution having a dielectric constant greater than the dielectric constant of water, said aqueous salt being incapable of oxidizing the sulfur in said particulate coal, and

(2) agitating said coal when in the form of an aqueous slurry to cause pyrites in said coal to be physically separated from the coal.

2. The process of claim 1 wherein said coal is characterized in having discrete striations of ash and pyrite in the coal matrix.

3. The process of claim 2 wherein said treating solution further contains a base.

4,167,398

CARBONACEOUS BRIQUETTE AND METHOD FOR MAKING SAME

John Hughes, Arlington Heights, and Peter L. Maul, Addison, both of Ill., assignors to American Colloid Company, Skokie, Ill.

Filed Mar. 13, 1978, Ser. No. 885,661

Int. Cl.[2] **C10L** *5/02*

U.S. Cl. 44—17 **8 Claims**

1. A combustible carbonaceous briquette having a high bond strength and good burning characteristics, consisting essentially of a combustible carbonaceous material and a bonding agent composition therefor, the bonding agent composition consisting essentially of from about 80% to 99.9%, by weight, of sodium bentonite and from about 0.1% to 5%, by weight, of a water soluble acid polymer; the amount of combustible carbonaceous material being from about 90% to 99%, by weight, based on the combined weight of the combustible carbonaceous material and binding agent composition, and the amount of binding agent composition being from 1% to 10%, by weight, based on the combined weight of the combustible carbonaceous material and binding composition.

3. A combustible carbonaceous briquette according to claim 2 wherein the binding agent composition also contains from 0.1% to 5%, by weight, of a water soluble dispersing agent.

7. A combustible carbonaceous briquette according to claim 3 wherein the binding agent composition contains an oxidizing agent.

4,167,399

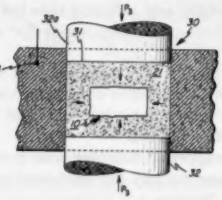
PROCESS FOR PREPARING A POLYCRYSTALLINE DIAMOND BODY

Minyoung Lee, Schenectady; Laurence E. Szala, Scotia, and Robert C. DeVries, Burnt Hills, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 844,446, Oct. 21, 1977, abandoned. This application Apr. 10, 1978, Ser. No. 894,760

Int. Cl.[2] C04B *35/56, 35/58*

U.S. Cl. 51—307 **7 Claims**



1. A process for preparing a polycrystalline diamond body at pressures substantially below those required by the diamond stable region which includes a hot-pressing step and which comprises:

(a) pressing a cavity in a pressure-transmitting powder medium that transmits applied pressure substantially undiminished and remains substantially unsintered during said hot-pressing;

(b) placing within said cavity a mass of silicon and a mass of diamond crystals in contact with said mass of silicon;

(c) covering said cavity and its contents with an additional amount of said pressure-transmitting powder medium thereby enveloping the cavity with pressure-transmitting powder medium;

(d) applying sufficient substantially isostatic pressure to said cavity and its contents via said powder medium to substantially stabilize the dimensions of said cavity and its contents substantially uniformly producing a shaped substantially isostatic system of powder-enveloped cavity and contents, wherein the density of diamond crystals is higher than 65% by volume of the volume of the resulting compressed mass of diamond crystals, said silicon being used in amount sufficient to fill the interstices of said compressed mass of diamond crystals;

(e) providing said substantially isostatic system including said cavity and contents with an atmosphere which has no significant deleterious effect on said diamond crystals and said silicon during said hot-pressing;

(f) hot-pressing the resulting substantially isostatic system to produce fluid silicon and infiltrate it through the interstices of said compressed mass of diamond crystals, said hot-pressing being carried out at a temperature ranging from a temperature at which said silicon becomes fluid up to about 1600° C. under a pressure sufficient to infiltrate the fluid silicon through the interstices of said compressed mass of diamond crystals, said hot-pressing converting less than 5% by volume of said diamond crystals to non-diamond elemental carbon, said infiltrating silicon encapsulating the surfaces of the compressed diamond crystals reacting with the diamond surfaces or any non-diamond elemental carbon producing silicon carbide at the surfaces of the diamond crystals;

(g) maintaining sufficient pressure on the resulting hot-pressed substantially isostatic system during cooling thereof to at least substantially maintain the dimensions of said hot-pressed system;

(h) recovering the resulting polycrystalline diamond body wherein the diamond crystals are bonded together by a silicon-atom containing medium comprised of silicon carbide and silicon, and wherein the diamond crystals are present in an amount of at least 65% by volume to about but less than 80% by volume of said body, said diamond body being at least substantially pore-free and being free of elemental non-diamond carbon phase in that it does not contain non-diamond elemental carbon phase in an amount detectable by X-ray diffraction analysis.

4,167,400

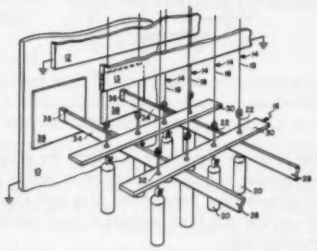
ELECTRODE RESTRAINING ASSEMBLY IN AN ELECTROSTATIC PRECIPITATOR

Andrew J. Onushco, Lebanon, Pa., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Jul. 27, 1978, Ser. No. 928,634

Int. Cl.[2] B03C *3/04*

U.S. Cl. 55—146 **2 Claims**



1. In an electrostatic precipitator of a type having a housing formed with walls defining an inlet for admitting a particulate carrying gas and an outlet for discharging such gas reduced in particulate concentration, collecting electrodes mounted in the housing spaced apart from one another and extending in parallel, and spaced-apart emitting electrodes suspended in the housing in rows between adjacent collecting electrodes; a restraining assembly comprising:

(a) an electrically-conductive rigid grid which extends horizontally within said housing and is supported by, and in electrical contact with, a plurality of the emitting electrodes adjacent their lower ends to maintain the mutual spacing of such emitting electrodes;

(b) positioning members mounted to said grid to extend horizontally therefrom toward the walls of the housing to restrict movement of the grid, said positioning members being formed of electrically non-conductive material; and

(c) plates of non-conductive material mounted vertically to the housing walls face to face therewith, and positioned so that each end of each one of said positioning members abuts a corresponding one of said plates to electrically insulate the grid from the housing walls, the surface area of each of said plates being substantially larger than the cross-sectional area of the abutting end of the positioning member adjacent thereto.

4,167,401

SCRUBBER HAVING FIXED THROAT VENTURI AND ADJUSTABLE PLUG

George G. Melnyk, Seven Hills, Ohio, assignor to Arthur G. McKee & Company, Cleveland, Ohio

Filed Jan. 4, 1979, Ser. No. 837

Int. Cl.[2] B01D *47/10*

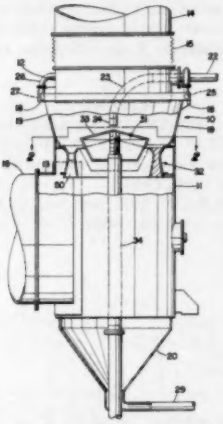
U.S. Cl. 55—224 **17 Claims**

1. Apparatus for scrubbing contaminants from a gas stream with a scrubbing liquid, which comprises:

a vertically extending cylindrical vessel having an upper gas stream inlet and a lower gas stream outlet;

means for forming an annular venturi gas flow passage fixed within the vessel, said means also forming a central opening;

a vertically movable plug supported within the central opening, the plug having a variable cross section and being



movable between a position in which the plug closes the central opening and other positions in which portions of the gas stream flow around the plug and through a secondary annular gas flow passage formed within the central opening; and

a scrubbing liquid supply means above the plug at the center line of the cylindrical vessel.

4,167,402

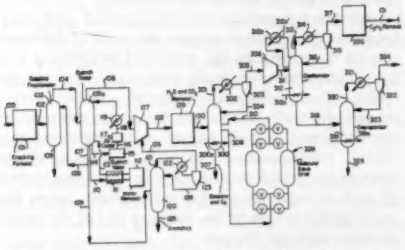
ETHYLENE SEPARATION PROCESS

James S. Davis, North Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 833,827, Sep. 16, 1977, abandoned. This application Mar. 20, 1978, Ser. No. 888,222

Int. Cl.² F25J 3/02

U.S. Cl. 62—28 **11 Claims**



1. A process for separating a hydrocarbon feed gas mixture comprising at least C_1–C_2 constituents including ethylene to produce a separated ethylene product, comprising the steps of:

(a) providing said hydrocarbon feed gas mixture at superatmospheric pressure between 200 and 700 psia, cooling same to condense a first liquid fraction comprising at least C_1–C_2 constituents, and separating said first liquid fraction from the uncondensed gas;

(b) fractionating the first liquid fraction in a demethanizer column at superatmospheric pressure of 100 to 350 psia to recover a demethanizer overhead comprising methane and a demethanizer bottoms comprising at least C_2 constituents;

(c) fractionating the demethanizer bottoms to recover ethylene as overhead product and ethane bottoms;

(d) further cooling the uncondensed gas of step (a) at high superatmospheric pressure of at least 350 psia to condense a second liquid fraction comprising C_1–C_2 constituents, and separating the second liquid fraction from the uncondensed further cooled gas;

(e) throttling the second liquid fraction to low superatmospheric pressure below 200 psia;

(f) mixing the throttled second liquid fraction with the demethanizer overhead to form a fluid mixture comprising C_1–C_2 constituents;

(g) stripping C_1 constituents from said fluid mixture by methane-containing vapor in a stripping zone to recover methane-rich vapor overhead and bottoms liquid containing methane and C_2 constituents;

(h) partially vaporizing said stripping zone bottoms liquid to form said methane-containing vapor for said stripping zone;

(i) separating the unvaporized stripping zone bottoms liquid from said vaporized methane-containing vapor and passing the latter to said stripping zone as said methane-containing vapor therefor; and

(j) passing the unvaporized stripping zone bottoms liquid to said demethanizer column for fractionation therein with said first liquid fraction.

4,167,403

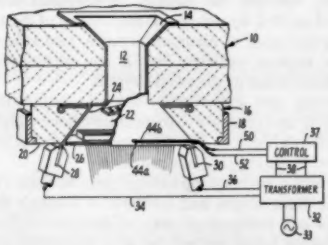
APPARATUS AND METHOD FOR MAINTAINING CALIBRATION OF A THERMOCOUPLE USED IN A BUSHING FOR THE DRAWING OF GLASS FIBER

Charles H. Coggin, Upland, Calif., assignor to Nitto Boseki Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 848,890, Nov. 7, 1977, abandoned. This application Jun. 13, 1978, Ser. No. 915,280

Int. Cl.² C03B 37/02

U.S. Cl. 65—1 **10 Claims**



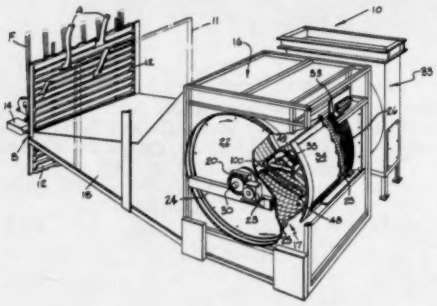
9. In combination with a metallic bushing for the drawing of glass fiber and a thermocouple connected to the bushing to sense bushing temperature, said thermocouple comprising dissimilar metallic leads connected to the bushing, at least one of which leads as the property of forming an alloy with the material of the bushing whereby the interface between the leads migrates, an improved method of maintaining the calibration of said thermocouple comprising extending said one lead directly from the bushing and over a length so closely adjacent the bushing that the temperature of said lead over said length is substantially equal to the temperature of the bushing.

4,167,404

METHOD AND APPARATUS FOR COLLECTING FIBROUS MATERIAL

Romain E. Loeffler; Samuel R. Genson, both of Littleton, Colo., and Jack L. Brunk, Toledo, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 780,876, Mar. 24, 1977, abandoned.
This application Jul. 3, 1978, Ser. No. 921,535
Int. Cl.[2] C03B *37/00*
U.S. Cl. 65—4 R 23 Claims



20. A method of producing and collecting fibrous material within a collection chamber including the steps of:

(a) producing and directing a stream of fibrous material towards a collection chamber;

(b) rotating a collection drum to move a fluid pervious peripheral surface thereof along a path, at least half of said path being located within said collection chamber and a portion of said path being located outside said collection chamber;

(c) drawing fibrous material onto said peripheral surface as it moves in said path within the collection chamber;

(d) sealing said portion of said peripheral surface moving in said portion of said path outside the collection chamber from said at least half of said path within said collection chamber; and

(e) removing said fibrous material from said path while said peripheral surface moves through said portion of said path outside said collection chamber.

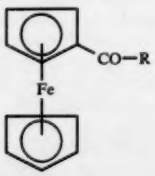
4,167,405

FERTILIZERS FOR SUPPLYING PLANTS WITH IRON

Volker Mues, Wuppertal, and Johannes Niggemann, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,479
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1977, 2702628
The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.
Int. Cl.[2] C05F *11/00*
U.S. Cl. 71—27 7 Claims

1. A method of supplying plants with iron, which comprises applying to the plants, or to the substrate in which they grow, at least one ferrocene derivative of the general formula



(I),

in which

R represents alkyl with 7 to 20 carbon atoms, alone or in admixture with a diluent or carrier.

4,167,406

HIGH TEMPERATURE DECOMPOSITION PROCESS FOR PRODUCING AN ALKALI-CONTAINING CALCINED PHOSPHATE FERTILIZER

Ulrich Hauschild, Hanover; Hans-Heinz Kaspers, Grossburgwedel ot Engensen, and Heinrich Rotger, Gehrden, all of Fed. Rep. of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Feb. 28, 1978, Ser. No. 882,268
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1977, 2709016
Int. Cl.[2] C05B *11/10, 13/02*
U.S. Cl. 71—45 6 Claims

1. An alkaline high temperature decomposition process for producing a calcined alkali calcium phosphate fertilizing agent in a rotary kiln which kiln comprises an inlet for solid material and discharge outlet at its end opposite the inlet and which kiln is heated by means of a direct flame-burner situated inside the kiln in the region of its discharge outlet and wherein flue gases from the burner are passed first through a calcining zone and subsequently through a preheating zone of the kiln towards the region of the inlet, said process comprising the steps of

(a) preparing a precursory mixture comprising a calcium phosphate; an alkaline agent selected from the group consisting of alkali-carbonates, alkali hydroxides and mixtures thereof; and silicic acid wherein when said alkaline agent is an alkali hydroxide it may be added directly into the rotary kiln prior to said preheating zone;

(b) introducing the precursory mixture into the rotary kiln at its inlet;

(c) progressively heating the precursory mixture up to a temperature of between about 900° and 1300° C. by continuously passing it through the kiln countercurrently to the flow of the flue gases from the kiln inlet through the preheating zone and subsequently through the calcining zone towards the discharge outlet;

(d) introducing an aqueous solution of phosphoric acid directly into the preheating zone;

(e) mixing the aqueous phosphoric acid solution in sufficiently finely divided form with the heated precursory mixture in a section of the preheating zone wherein the precursory mixture has been heated to a temperature of between about 150° and 900° C. which is sufficiently high to cause rapid vaporization of free and of chemically bound water in the phosphoric acid solution and at such a rate that a complete mixture is obtained wherein the ratio between the calcium phosphate, the alkaline agent and the phosphoric acid is equivalent to a ratio of 1 mole of P_2O_5 per about 1.1 to 1.8 moles of alkalioxide, and SiO_2 is present in the complete mixture in an amount which is sufficient to combine as calcium orthosilicate with the amount of CaO which exceeds the molar ratio 2 CaO:1 P_2O_5;

(f) passing the heated complete mixture into the calcining zone of the rotary kiln;

(g) calcining the preheated mixture in the calcining zone at a temperature of from about 900° to about 1300° C.; and

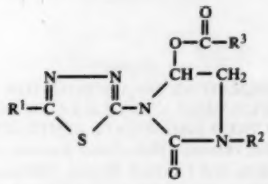
(h) recovering the calcined mixture at the discharge outlet of the rotary kiln.

4,167,407
1-THIADIAZOLYL-5-ACYLIMIDAZOLIDINONES

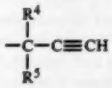
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Apr. 25, 1975, Ser. No. 571,466
The portion of the term of this patent subsequent to Dec. 14, 1996, has been disclaimed.
Int. Cl.[2] A01N 9/12; C07D 417/04
U.S. Cl. 71—90 10 Claims

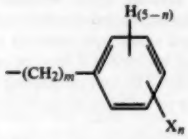
1. A compound of the formula



wherein R^1 is selected from the group consisting of alkyl of up to 3 carbon atoms, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower chloroalkyl, lower bromoalkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and



wherein R^4 and R^5 are each selected from the group consisting of hydrogen and alkyl of up to 3 carbon atoms; and R^3 is selected from the group consisting of lower alkenyl, lower haloalkyl, lower alkynyl, lower alkoxyalkyl, cycloalkyl of from 3 to 7 carbon atoms and



wherein X is selected from the group consisting of lower alkyl, lower alkoxy, halogen, lower haloalkyl, nitro, cyano and lower alkylthio; n is an integer from 0 to 3; and m is the integer 0 or 1.

2. 1-(5-methyl-1,3,4-thiadiazol-2-yl)-3-methyl-5-acetyloxy-1,3-imidazolidin-2-one.

9. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of claim 1.

4,167,408
Patent Not Issued For This Number

4,167,409
PROCESS FOR LOWERING THE SULFUR CONTENT OF VANADIUM-CARBON MATERIALS USED AS ADDITIONS TO STEEL

James H. Downing, Clarence, and Rodney F. Merkert, Buffalo, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

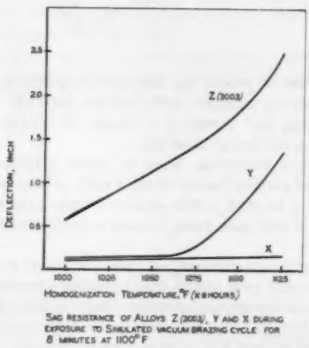
Continuation of Ser. No. 827,074. Aug. 23, 1977, which is a continuation of Ser. No. 700,472, Jun. 28, 1976, abandoned. This application Sep. 11, 1978, Ser. No. 941,403
Int. Cl.[2] C22B 34/22
U.S. Cl. 75—129 4 Claims

1. In the manufacture of a vanadium and carbon containing material at least about 80% by weight being in the form of combined vanadium and carbon with the predominant proportion of combined vanadium being in the form of V_2C and the atomic ratio of vanadium to carbon being in the range of 1.49 to 2.42, by vacuum furnacing of a mixture of vanadium oxide and a carbon source material containing sulfur, the improvement for lowering the sulfur content of said material which comprises adding to said mixture prior to furnacing thereof at least one material selected from the group consisting of silicon, silica and tin wherein the aggregate amount of silicon and tin is from about 1 to 9 times by weight the amount of sulfur in the carbon constituent in the mixture of vanadium oxide and carbon.

4,167,410
ALLOY FOR USE IN BRAZED ASSEMBLIES

William H. Anthony, Manchester, Mo.; James M. Popplewell, Guilford, and Andrew J. Brock, Cheshire, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation-in-part of Ser. No. 773,959, Mar. 3, 1977, Pat. No. 4,093,782. This application Feb. 24, 1978, Ser. No. 881,071
Int. Cl.[2] C22C 21/00
U.S. Cl. 75—138 5 Claims



SAG RESISTANCE OF ALLOYS Z (3003), Y AND X DURING EXPOSURE TO SIMULATED VACUUM BRAZING CYCLE FOR 6 MINUTES AT 1100° F

1. An improved corrosion resistant aluminum alloy exhibiting improved sag resistant properties when used in the manufacture of brazed assemblies, said alloy consisting essentially of not less than 0.15% and not more than 0.40% chromium, not less than 0.2% and not more than 0.9% manganese, up to 0.2% iron, up to 0.1% silicon, balance essentially aluminum.

4,167,411
METHOD FOR MAKING REPRODUCTIONS OF A GRAPHIC ORIGINAL FROM A HIGH OUTPUT ELECTROSTATIC REPRODUCTION EQUIPMENT

Virgil W. Westdale, Chagrin Falls, and Charles A. Kumins, Gates Mills, both of Ohio, assignors to AM International, Inc., Los Angeles, Calif.

Continuation of Ser. No. 786,517, Apr. 11, 1977, abandoned, which is a division of Ser. No. 570,279, Apr. 21, 1975, which is a continuation-in-part of Ser. No. 362,981, May 23, 1973, abandoned. This application Apr. 24, 1978, Ser. No. 899,140
Int. Cl.[2] G03G 13/08
U.S. Cl. 96—1 SD 1 Claim

1. A method of making a reproduction of a graphic original using high output electrostatic reproduction equipment which utilizes photoconductive members that are each developed in sequence using a developer mix and wherein the longevity of said developer mix is affected by the stress to which it is subjected in the environment of said high output equipment, said method comprising the steps of:

applying a blanket electrostatic charge to said photoconductive member;

exposing said charged photoconductive member to a pattern

of light and shadow to produce an electrostatic latent image thereon; and

applying a developer mix which is resistant to the stress of said high output equipment, which mix is drawn from a supply source and applied to said electrostatic latent image, said developer mix comprising carrier particles having an average particle size within the range of 25 to 500 microns, pigmented thermoplastic toner particles, and from about 0.005 to about 1.0 percent of a particulate material additive selected from the group consisting of molybdenum disulfide, titanium disulfide, tungsten disulfide and graphite based on the weight of said carrier particles and returning the unconsumed developer mix to said supply source less the toner particles which are attracted to the image.

4,167,412
PYRYLIUM SENSITIZERS FOR PHOTOCONDUCTIVE COMPOSITIONS

Michael T. Regan, Fairport; George A. Reynolds, Rochester; Donald P. Specht, Spencerport, and James A. Van Allan, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

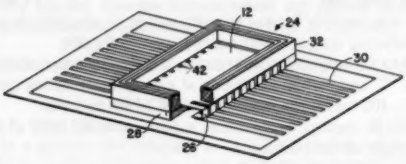
Continuation-in-part of Ser. No. 711,046, Aug. 2, 1976, abandoned. This application Mar. 13, 1978, Ser. No. 885,927
Int. Cl.² G03G *5/09, 5/07*
U.S. Cl. 96—1.6 **22 Claims**

12. A photoconductive insulating composition comprising an electrically-insulating polymeric binder, photoconductor and a sensitizing amount of a sensitizer for said compound wherein said sensitizer is selected from a 2,4,6-trisubstituted pyrylium dye salt having at least one heterocyclic substituent being a 5 to 6 member ring wherein said ring has at least one atom selected from the group consisting of H, O or S, provided that said heterocyclic substituent is other than pyrylium or thiopyrylium.

4,167,413
MAKING HYBRID IC WITH PHOTORESIST LAMINATE

Allen E. Christ, Scottsdale; Dennis R. Sprague, Mesa, and Bernhard A. Ziegner, Gilbert, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 14, 1977, Ser. No. 851,247
Int. Cl.² G03C *5/00*
U.S. Cl. 96—36.2 **4 Claims**



1. A method for making a hybrid integrated circuit package comprising the steps of:

providing a ceramic substrate member;

applying a blank metallized pad to said substrate member;

applying metallized feedthroughs to said substrate member extending outwardly from said blank metallized pad toward the edge of said substrate member;

joining a ceramic seal ring to said substrate member to surround said blank metallized pad, said metallized feedthroughs extending outwardly from said seal ring;

plating said blank metallized pad and said metallized feedthroughs;

connecting external leads to said feedthroughs; and

patterning said blank metallized pad surrounded by said ceramic seal ring to accommodate a particular integrated circuit by cutting a piece of dry film photoresist material to the approximate interior dimensions of said seal ring;

laminating said piece of dry film photoresist material to said blank metallized pad by simultaneously applying pressure and heat to said piece;

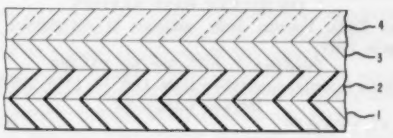
exposing said piece of dry film photoresist material through a photographic mask using a collimated light source; and

etching said blank metallized pad using said dry film photoresist material as a mask.

4,167,414
REFLECTIVE OPAQUE POLYESTER FILM BASE SUPPORT FOR INVERSE TRANSFER NEGATIVE EMULSIONS

James G. Morgan, Cranbury, N.J., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Sep. 28, 1978, Ser. No. 946,717
Int. Cl.² G03C *1/78*
U.S. Cl. 96—87 R **7 Claims**



1. A photographic film comprising an energy-treated opaque polyester film base support, one surface of which is coated, in order, with

(1) a reflective layer comprising titanium dioxide, a polyfunctional aziridine, and a binder,

(2) a gelatin-containing sub-overcoat layer, and

(3) a photosensitive gelatino-silver halide emulsion layer,

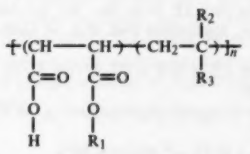
characterized in that the binder of layer (1) is an acrylic polymer which is crosslinked to the functional groups in the energy-treated base by means of said aziridine.

4,167,415
PHOTOCURABLE COMPOSITION COMPRISING COPOLYMER OF MALEIC ACID MONOESTER AND α-OLEFIN COMPOUND

Tetsuo Higuchi, and Hiroyuki Nakayama, both of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

Continuation of Ser. No. 646,155, Jan. 2, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,804
Claims priority, application Japan, Jul. 11, 1975, 50-85033
Int. Cl.² G03C *1/68, 5/00*
U.S. Cl. 96—115 R **7 Claims**

1. A photocurable composition especially adapted for the formation of printing plates which consist essentially of (A) a mixture of 20 to 90% by weight of a maleic acid/isobutylene copolymer of the formula:



wherein R_1 is an alkyl group having 1 to 8 carbon atoms, aralkyl group, or cycloalkyl group, R_2 is methyl, R_3 is methyl and n is an integer which provides a number average molecular weight of 80,000 to 170,000 and 10 to 80% by weight of a polymerizible ethylenically unsaturated compound having a number average molecular weight of less than 3,000 and a boiling point of more than 100° C. at normal pressure; and (B)

0.01–5% by weight based on the weight of (A) of a photosensitizer.

4,167,416

COMPOSITION FOR THE ELECTROLESS DEPOSITION OF NICKEL BASE ALLOYS

Bruno Zolla, Pecetto, Italy, assignor to Alfachimici S.p.A., Turin, Italy

Filed Sep. 7, 1977, Ser. No. 831,300
Claims priority, application Italy, Oct. 19, 1976, 69510 A/76
Int. Cl.[2] C23C *3/02*
U.S. Cl. 106—1.25 6 Claims

1. In a composition for the electroless deposition of a nickel base alloy containing, in aqueous solution, at least one nickel salt, a hypophosphite or a boron compound reducing agent, at least one compounding agent for the metallic ions present in the solution, and at least one pH stabilizing agent; the improvement in which the composition also contains vanadium ions and ions of at least one metal selected from the group consisting of thallium, zinc, tin and tungsten.

4,167,417

FLUORESCENT INORGANIC PIGMENT

Karl Franz, Barsinghausen, and Wolfgang Jäger, Rehburg, both of Fed. Rep. of Germany, assignors to Riedel-de Haen Aktiengesellschaft, Seelze, Fed. Rep. of Germany

Filed Jun. 21, 1978, Ser. No. 917,584
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728266
Int. Cl.[2] C09K *3/00, 11/16, 11/20*
U.S. Cl. 106—35 4 Claims

1. Fluorescent inorganic pigment having the following composition

$(X.SE+A.Ce+B.Tb+C.Mn)_2O_3.SiO_2$

in which the symbols have the following meaning:

SE is at least one of the elements yttrium, gadolinium and lanthanum,

A is of from 2 to 10 mol percent,

B is of from 2 to 10 mol percent,

C is of from 0.5 to 2.5 mol percent,

X is 100−(A+B+C) mol percent.

4,167,418

PROTECTIVE COATING FOR METAL INGOT MOLDS AND CORES

Lazar D. Svirsky, ulitsa Pushkinskaya, 74, kv. 84; Valentina P. Zhurzhenko, ulitsa Artema, 26, kv. 1; Tamara S. Bondarenko, ulitsa Galana, 3, kv. 4; Antonina K. Savenkova, ulitsa Gvardeitsev Shironintsev, 38, kv. 143; Valery M. Kazakevich, ulitsa Pushkinskaya, 49a, kv. 14, all of Kharkov; Yakov A. Shneerov, ulitsa Dzerzhinskogo 8, kv. 21, Dnepropetrovsk; Evgeny M. Ogryzkin, prospekt K. Marxa, 10, kv. 37, Dnepropetrovsk; Anatoly A. Geizenblaz, ulitsa Dzerzhinskogo, 15, kv. 1, Dnepropetrovsk; Gennady S. Kolganov, ulitsa Revoljutsionnaya, 31, kv. 26, Krivoi Rog Dnepropetrovskoi oblasti; Vladislav V. Burshtein, ulitsa Bensitskaya, 8, kv. 3, Krivoi Rog Dnepropetrovskoi oblasti; Vladimir F. Sivakov, ulitsa Postysheva, 5, kv. 14, Krivoi Rog Dnepropetrovskoi oblasti; Evgeny A. Bogdanovich, ulitsa Zernovaya, 1a, kv. 16, Kharkov; Vitaly M. Burdonos, Naberezhnaya, 16, kv. 52, Dnepropetrovsk; Viktor N. Andrjuschenko, ulitsa Postysheva, 9, kv. 111, Krivoi Rog Dnepropetrovskoi oblasti; Oleg A. Bushinsky, prospekt Mira, 17, kv. 157, Krivoi Rog Dnepropetrovskoi oblasti; Grigory A. Makarov, ulitsa Kosiora, 75, kv. 29, Krivoi Rog Dnepropetrovskoi oblasti; Oleg V. Filonov, ulitsa Kosiora, 12, kv. 8, Krivoi Rog Dnepropetrovskoi oblasti; Vladimir I. Tupitsa, ulitsa Revoljutsionnaya, 6, kv. 44, Krivoi Rog Dnepropetrovskoi oblasti; Valery I. Nikitenko, prospekt Metallurgov, 14, kv. 26, Krivoi Rog Dnepropetrovskoi oblasti, and Nikolai M. Omes, ulitsa Tynka, 32, kv. 48, Krivoi Rog Dnepropetrovskoi oblasti, all of U.S.S.R.

Filed Sep. 26, 1977, Ser. No. 836,490
Int. Cl.[2] B28B *7/36*
U.S. Cl. 106—38.28 5 Claims

1. A protective coating for metal ingot molds, casting molds and cores, consisting of fire clay, graphite, water glass, water and a glassceramic component consisting of an alumina-containing material in an amount of not more than a half the weight of the total mixture and containing not less than 70 percent by weight of Al_2O_3, in alpha form, by weight of its chemical composition.

4,167,419

MIX SUITABLE FOR USE IN SEAMS BETWEEN CARBON BLOCKS

M. Benjamin Dell, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 11, 1974, Ser. No. 449,592
Int. Cl.[2] C08L *95/00*
U.S. Cl. 106—284 3 Claims

1. A mix suitable for use as seam mix in an electrolytic cell for producing aluminum, consisting essentially of

(1) 7 to 17 weight-percent binder of softening point of 48 to 54° C. and carbon aggregate at a weight-percent of quantity 100 minus the weight-percent of binder, and

(2) crude methyl naphthalene solvent at 8 to 16% of the weight of the binder.

4,167,420

PROCESS FOR DISPERSING PIGMENTS AND FILLERS USING AMINOALKANOLS AND SALT, ALKOXYLATION AND QUATERNIZATION DERIVATIVES THEREOF

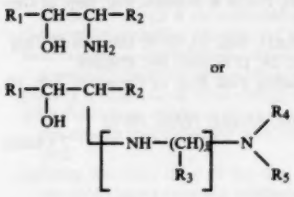
Heinrich Linden, Düsseldorf; Horst Rutzen, Langenfeld, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,229
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738538
Int. Cl.[2] C09C *1/24, 1/36, 3/05*
U.S. Cl. 106—288 B 19 Claims

1. In a process for treating inorganic or organic pigments and fillers with a dispersing agent in order to improve their

dispersibility in organic and aqueous media, the improvement comprising utilizing as the dispersing agent a member selected from the group consisting of

(a) a mixture of vicinal aminoalkanols of the formulae

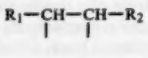


(I)

or

(II),

wherein R_1 and R_2 are independently alkyl having 1 to 21 carbon atoms and the sum of the carbon atoms in R_1 and R_2 is from 6 to 22 inclusive, R_3 is a member selected from the group consisting of hydrogen and methyl, provided that there is only one methyl group per $(CH)_x$ group R_4 and R_5 are the same or different and are a member selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms and hydroxyalkyl having 2 to 4 carbon atoms, x is an integer of from 2 to 6 inclusive and y is 0, 1, 2 or 3, the



units in the aminoalkanols being of at least two different chain lengths of from 8 to 24 carbon atoms inclusive, and the vicinal substituents being distributed statistically along said chain lengths, with the proviso that, if y is 0, R_4 and R_5 are not both hydrogen,

(b) salts of said aminoalkanols,

(c) alkoxylation products of said aminoalkanols with ethylene oxide and/or propylene oxide, and

(d) quaternization products of said aminoalkanols.

4,167,421
PROCESS FOR DISPERSING PIGMENTS AND FILLERS USING AMINOALKANOLS AND SALT, ALKOXYLATION AND QUATERNIZATION DERIVATIVES THEREOF

Heinrich Linden, Düsseldorf; Horst Rutzen, Langenfeld, and Bernd Wegemund, Haan, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Aug. 2, 1978, Ser. No. 930,228

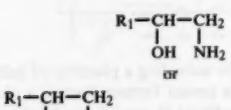
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738539

Int. Cl.[2] **C09C** *1/24, 1/36, 3/08*

U.S. Cl. 106—288 B **19 Claims**

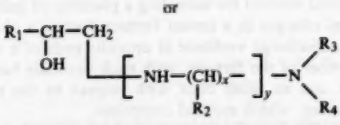
1. In a process for treating inorganic or organic pigments and fillers with a dispersing agent in order to improve their dispersibility in organic and aqueous media, the improvement comprising utilizing as the dispersing agent a member selected from the group consisting of

(a) at least one aminoalkanol of the formulae



(I)

or



(II),

wherein R_1 is alkyl having 6 to 22 carbon atoms, R_2 is a member selected from the group consisting of hydrogen and methyl, provided that there is only one methyl group per $(CH)_x$ group, R_3 and R_4 are the same or different and are a member selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms, and hydroxyalkyl having 2 to 4 carbon atoms, x is an integer of from 2 to 6 inclusive, and y is an integer of from 0 to 3 inclusive, with the proviso that, if y is 0, R_3 and R_4 are not both hydrogen,

(b) salts of said aminoalkanol,

(c) alkoxylation products of said aminoalkanol with ethylene oxide and/or propylene oxide, and

(d) quaternization products of said aminoalkanol.

4,167,422
LAKED HIGH MOLECULAR WEIGHT DYES

Nicolo Bellanca, and Thomas E. Furia, both of San Jose, Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Aug. 30, 1974, Ser. No. 501,900

Int. Cl.[2] **C04B** *31/38*

U.S. Cl. 106—289 **15 Claims**

1. A non-bleeding, high load capacity organic pigment color lake, which lake comprises (1) an acid soluble macromolecular polymeric dye, said dye comprising both an organic chromophoric and an organic non-chromophoric moiety chemically linked together in the ratio of from 0.2 to 1.5 parts by weight of non-chromophoric moiety for each part by weight of chromophoric moiety; said dye being absorbed onto (2) a particulate, water insoluble solid opaque inorganic oxide extender therefor having a particle size of from 0.5 to 50 microns, and said lake displaying essentially total lack of bleed and being essentially insoluble at acidic pH.

4,167,423
SILANE REACTIVE MINERAL FILLERS

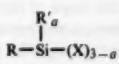
Thomas C. Williams, Ridgefield, Conn., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 567,817, Apr. 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 476,567, Jun. 5, 1974, abandoned. This application Jul. 21, 1977, Ser. No. 817,688

Int. Cl.[2] **C09C** *1/02*

U.S. Cl. 106—306 **7 Claims**

1. An organosilane modified metal silicate treated inorganic mineral composition, said composition having been produced by a process which comprises contacting a water-insoluble metal silicate treated inorganic mineral product, said product having been produced by a process which comprises (a) contacting in the presence of water, the surface of naturally occurring water-insoluble calcium carbonate with a precipitated, undried water-insoluble metal silicate salt wherein the metal of said salt is selected from the group consisting of aluminum, barium, beryllium, cadmium, calcium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, nickel, silver, strontium, tin, zinc, zirconium, and the rare earth metals having atomic numbers from 57 to 71 inclusive, and mixtures thereof, wherein the amount of said water-insoluble metal silicate salt employed ranges from about 0.1 parts by weight to about 20.0 parts by weight per 100 parts by weight of said water-insoluble calcium carbonate, and (b) drying said water-insoluble metal silicate salt on the surface of said water-insoluble calcium carbonate; with an organosilane coupling agent selected from the group consisting of organo-functional silanes having the formula



wherein R which contains a carbon atom directly bonded to the Si atom of the above formula represents a functionally substituted organic radical, R′ represents a radical selected from the group consisting of R and monovalent hydrocarbon radicals, a has a value of 0 or 1, and X represents a hydrolyz-

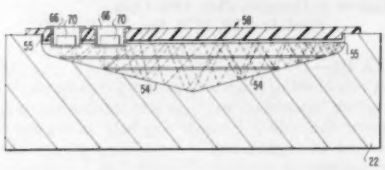
able group, the hydrolyzates of said silanes, the condensates of said silanes, and mixtures thereof.

4,167,424

TREATMENT OF METAL STRIP WITH ULTRASONIC ENERGY AND APPARATUS THEREFOR

Duncan Jubenville, Windsor, Canada, and Donald J. Kenney, Mt. Clemens, Mich., assignors to National Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 685,800, May 12, 1976, abandoned. This application Sep. 6, 1977, Ser. No. 830,835
Int. Cl.[2] B08B *3/12*
U.S. Cl. 134—1 **37 Claims**



1. The method of continuously treating moving metal strip with ulstrasonic wave energy comprising

providing an elongated open top tank having end walls extending along the width of the tank, sidewalls extending along the length of the tank and having a bottom wall sloping downwardly from each sidewall toward the other sidewall, the upwardly facing surface of the tank bottom wall having the ability to reflect ultrasonic wave energy efficiently,

providing a body of treating solution in the tank having a top surface located above the bottom of the tank a distance not substantially greater than that required to cover the widest metal strip to be treated,

introducing the moving metal strip into the body of treating solution near one end wall of the tank, moving the metal strip through the treating solution and withdrawing the metal strip from the treating solution near the other end wall of the tank,

providing a plurality of receptacles, each receptacle holding a body of liquid other than the treating solution and being positioned with the bottom wall of the receptacle in contact with the treating solution and above the moving strip, the bottom wall of the receptacle being formed of ultrasonic wave energy transmissible material,

generating a beam of ultrasonic wave energy entirely under the surface of the body of liquid in each receptacle,

arranging the plurality of receptacles along the length dimension of the moving metal strip with each of the plurality of beams of ultrasonic wave energy generated in the receptacles directed downwardly toward one of the marginal portions of the moving metal strip, and

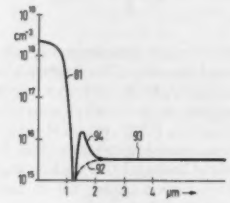
projecting the generated beam of ultrasonic wave energy through the bottom wall of each receptacle, through said marginal portion of the moving metal strip and onto the bottom of the tank so as to be reflected therefrom, the angle of incidence of the beam of ultrasonic wave energy on the bottom and the slope of the bottom at the place of incidence of the beam on the bottom being such that the reflected beam passes through the moving metal strip at a different place located inwardly of said marginal portion relative to the width of the strip from the place where the beam first passed through the moving metal strip and the reflected beam impinges against and is again reflected from the top surface of the treating solution and passes through the moving metal strip at still another place.

4,167,425

METHOD FOR PRODUCING LATERAL BIPOLAR TRANSISTOR BY ION-IMPLANTATION AND CONTROLLED TEMPERATURE TREATMENT

Heiner Herbst, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Division of Ser. No. 724,621, Sep. 20, 1976, abandoned. This application Apr. 24, 1978, Ser. No. 899,264
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1975, 2541907
Int. Cl.[2] H01L *21/265, 21/26, 29/72*
U.S. Cl. 148—1.5 **7 Claims**



1. A method for producing a lateral bipolar transistor having a semiconductor substrate of p conductivity type, an epitaxial layer arranged thereon of n conductivity type, lateral base and emitter zones in said epitaxial layer; a buried layer of n conductivity type beneath said base and emitter zones in said epitaxial layer and a high potential barrier beneath the emitter zone to prevent vertical injection current, comprising the steps of:

(a) ion implanting donor ions down into the emitter zone;

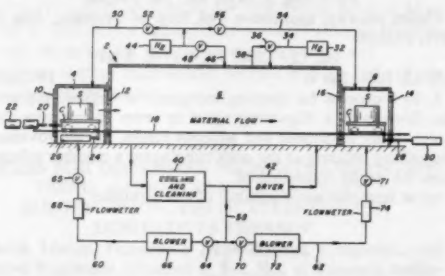
(b) temperature treating the implanted ions to cause diffusion more vertically than laterally, a front of the diffusion extending beyond the emitter zone in the vertical direction but not as far as the buried layer to create said high potential barrier and not beyond the emitter zone in any lateral direction.

4,167,426

METHOD FOR ANNEALING SILICON STEEL

Ralph E. Snyder, Export, and Philip R. Robinson, New Kensington, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Apr. 20, 1978, Ser. No. 898,010
Int. Cl.[2] H01F *1/04*
U.S. Cl. 148—113 **3 Claims**



1. An improved method for annealing a plurality of individual silicon steel charges in a tunnel furnace having a charge vestibule and a discharge vestibule at opposite ends of a main annealing chamber of the furnace, with each vestibule having an inner door and an outer door with respect to the main annealing chamber, which method comprises:

providing a plurality of silicon steel charges in the main annealing chamber of the furnace with the inner doors of the vestibules closed,

providing a hydrogen atmosphere in the main annealing chamber of the furnace,

circulating the hydrogen atmosphere through the main annealing chamber of the furnace by continuously feeding the hydrogen atmosphere from the main chamber of the furnace through a reconditioning apparatus and back to the main annealing chamber of the furnace,

maintaining a substantially constant pressure in the main annealing chamber of the furnace,

placing a cold silicon steel charge in the charge vestibule,

with the charge vestibule doors closed, successively purging the charge vestibule first with nitrogen then with hydrogen,

opening the inner door of the charge vestibule and moving the cold charge from the vestibule into the main annealing chamber of the furnace,

after the charge has been annealed, purging the discharge vestibule with hydrogen,

opening the inner door of the discharge vestibule and moving the annealed charge from the main annealing chamber to the discharge vestibule,

closing the inner door of the discharge vestibule and purging the discharge vestibule with nitrogen,

opening the outer door of the discharge vestibule, and

removing the annealed charge from the tunnel furnace,

wherein the improvement comprises:

intermittently removing a substantial amount of hydrogen from the circulating hydrogen atmosphere at a location upstream of the discharge end of the reconditioning apparatus,

feeding the removed hydrogen to the respective charge and discharge vestibules when a hydrogen purge is required therein, and

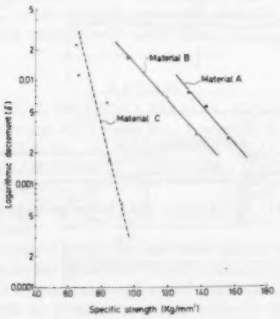
while removing hydrogen from the circulating hydrogen atmosphere, feeding hydrogen from a separate hydrogen source to the circulating hydrogen atmosphere in an amount sufficient to maintain the substantially constant pressure in the main chamber of the furnace.

4,167,427

HEAT TREATMENT OF TITANIUM ALLOYS

Shoji Ueda; Takashi Daikoku, both of Nagasaki; Yorimasa Takeda, Isahaya; Akira Hiromoto, Nagasaki; Nobuyuki Nagai, Kobe; Yasuo Moriguchi, Nishinomiya, and Yoshimasa Ito, Kobe, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo and Kobe Steel, Ltd., Kobe, both of, Japan

Filed Oct. 18, 1977, Ser. No. 843,251
Claims priority, application Japan, May 25, 1977, 52-60792
Int. Cl.[2] C22F *1/18*
U.S. Cl. 148—133 **2 Claims**



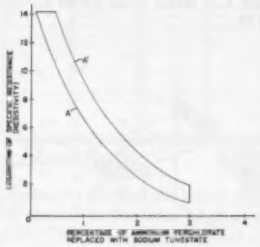
1. A process for heat treating titanium alloys which comprises heating and holding an $\alpha+\beta$ titanium alloy of the Ti—6Al-V-Mo system in a temperature range over 500° C. and below the $\alpha+\beta/\beta$ transformation point, quenching, and then aging the same at a temperature in the range between 50° C. and 300° C., inclusive.

4,167,428

CONDUCTANCE METHOD FOR DETERMINING THE MECHANICAL PROPERTIES OF PROPELLANTS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 17, 1974, Ser. No. 471,251
Int. Cl.[2] C06B *23/00*
U.S. Cl. 149—109.6 **7 Claims**



1. A conductance method for assessing the changes that can occur in a solid propellant grain during storage, said changes being related to changes in electrical conductances which provide a means for determining when said propellant grain has undergone an adequate level of deterioration that would render said propellant grain unsafe for firing, said conductance method for assessing the changes including indirectly correlating said electrical conductances with measured mechanical properties of a propellant grain that has been changed from a non-conductive filled elastomer into a highly-conductive filled elastomer, said method comprising:

(i) introducing an effective amount, from about 1 to about 3 parts in each hundred parts of propellant ingredients, of a tungstate selected from the tungstates consisting of the tungstates having an empirical formula $X_{0.25}WO_3$ to $X_{0.9}WO_3$, where X is an alkali metal ion or NH_4 ion, into an uncured non-conductive propellant composition to change the uncured non-conductive propellant composition into a highly-conductive propellant composition when cured to form a propellant grain, said non-conductive propellant composition comprised of ammonium perchlorate oxidizer from about 65 to about 69 parts, aluminum metal fuel, binder selected from the group consisting of polybutadiene-acrylic acid prepolymer with an effective amount of Bisphenol A curative and carboxy-terminated polybutadiene with curing agent comprised of tris 1-(2-methylaziridinyl) phosphine oxide and tris (2,3-epoxypropyl)-1,4 aminophenol, and ferric oxide catalyst;

(ii) curing said propellant composition to form a propellant grain that is highly conductive;

(iii) measuring the electrical conductance and mechanical properties of said propellant grain which include modulus, maximum stress, strain at maximum stress, and strain at cracking to establish a first correlative relationship between the measured value of conductance and of said mechanical properties;

(iv) re-measuring the electrical conductance and said mechanical properties after an aging period of about three months and after subsequent periods of storage times have elapsed for said propellant grain to establish a second and subsequent correlative relationship between the re-measured values of conductance and of said mechanical properties; and thereafter,

(v) correlating changes in said re-measured values of electrical conductance which parallel the changes which are

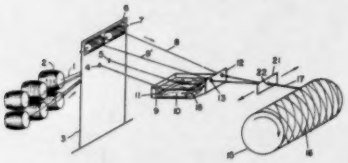
re-measured in said mechanical properties during a comparable time frame to indicate changes in said mechanical properties of said propellant grain due to accumulated effects of non-homogeneity in said grain, dewetting of the oxidizer from the binder of said grain, strain-induced anisotropy within said propellant grain, and the like.

4,167,429

METHOD OF MANUFACTURING RESIN SHEETS REINFORCED WITH GLASS AND CARBON STRAND

Richard H. Ackley, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 30, 1977, Ser. No. 856,149
Int. Cl.[2] B32B *5/02*; B65H *81/00*
U.S. Cl. 156—174 **5 Claims**



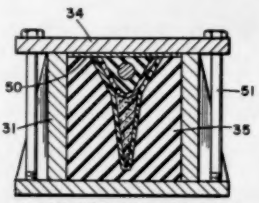
1. A method of forming a sheet of resin reinforced with glass and carbon strands comprising coating glass strands with a heat curable polyester resin, passing the coated glass strands through a metering means to remove excess resin and regulate the glass-resin content on a weight basis, introducing carbon strand directly into the metering means to minimize fiberizing of said carbon strand, wetting the carbon strand with resin as it passes through the metering means and consolidating the carbon strand with the glass strand, removing the consolidated glass and carbon strand from the metering means and directing it onto the surface of a rotating mandrel, reciprocating the consolidated strand across a rotating surface to apply said consolidated strand on said surface in successive layers and cutting the resulting layered composite resin consolidated strand product from the surface.

4,167,430

METHOD FOR FABRICATING A COMPOSITE BONDED STRUCTURE

John M. Arachi, Riverside, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Apr. 28, 1978, Ser. No. 901,367
Int. Cl.[2] B29D *3/00, 3/02*; B29G *5/00*
U.S. Cl. 156—212 **5 Claims**



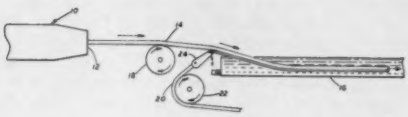
1. The method for forming an air foil, comprising:
forming an outside skin for said air foil by disposing fibrous layers inpregnated with curable resin about polysilicone rubber walls defining a mold cavity of a first mold member;
inserting a preformed foam core member within said layers;
disposing additional fibrous layers about a male mold member and inserting said male mold member with said additional fibrous layers into said mold cavity and in contact with said foam core member;
inserting said first mold member with assembled said fibrous layers, said additional said fibrous layers, said male mold member and said core member into a rigid container;
heating said container and assembled said layers to a temperature sufficient to cure the resin in said layers; said first mold member expanding due to said heating and compressing the assembled said layers about said core member; and
bonding said layers together and to said core; said male mold member forming a channel along one side of said air foil.

4,167,431

METHOD OF HEAT LAMINATION AND LAMINATED PRODUCT

Tony K. M. Wong, Islington, Canada, assignor to Morgan Adhesives Company, Stow, Ohio

Filed Feb. 6, 1975, Ser. No. 547,587
Int. Cl.[2] B29D *7/02*
U.S. Cl. 156—244.11 **4 Claims**



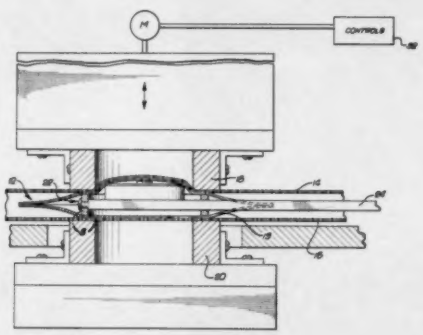
1. A method of forming a laminate of a flexible polymeric foam and a polymeric extrusion, comprising the steps of feeding a hot polymeric extrusion from an extruder along a path to a cooling area and a continuously changing portion of the extrusion is not directly supported in such movement, moving the foam layer into physical contact with said portion of the extrusion for adhesion thereto prior to moving to the cooling area, said foam layer having a heat sealing coating which is activated at a temperature below the softening point of the foam, said foam layer being fed to the extrusion when the surface temperature of the extrusion is high enough to activate the heat sealing coating without softening the foam layer.

4,167,432

PROCESS OF MAKING A WATER BED MATTRESS

Carlos A. Mollura, 2824 Del Oro Pl., Fullerton, Calif. 92635

Filed Apr. 7, 1978, Ser. No. 894,427
Int. Cl.[2] B29C *19/04*; B23K *13/02*; H05B *9/04*
U.S. Cl. 156—273 **3 Claims**



1. The process of making a waterbed mattress having heat weldable top and bottom mattress layers and a plurality of heat weldable baffle bags or bladders, which comprises:
(a) positioning bag or bladder between the mattress layers before the layers are peripherally closed;

(b) locating the mattress layers and the bag or bladder between relatively broad area plates or heads of a dielectric heating machine;
(c) inserting a relatively narrow electrically conductive die inside the bag or bladder substantially in alignment with said plates to determine regions localized heating and localized plastic extrusion at the inside of the bag rather than at the outside of said mattress layer;
(d) closing the dielectric plates about the four plastic layers as well as about the die;
(e) applying high frequency current across the plates or heads of the dielectric machine; and
(f) opening the plates and removing the die.

4,167,433

ADHESIVE COMPOSITION AND PROCESS FOR BONDING

Pallavoor R. Lakshmanan, Houston, Tex., assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Nov. 3, 1977, Ser. No. 848,286
Int. Cl.[2] C08L *93/00*
U.S. Cl. 156—322 **27 Claims**

1. An adhesive composition effective in bonding low-energy plastic surfaces to each other which provides low temperature performance consisting essentially of: (1) a first ethylene-vinyl ester copolymer having from about 4 to 35 weight percent of a vinyl ester; (2) a second ethylene-vinyl ester copolymer having about 36 to about 48 weight percent of a vinyl ester; (3) a tackifier selected from the group consisting of (a) a rosin, (b) a rosin ester, (c) a terpene resin, (d) a terpenephenolic resin and (e) a rosin-modified phenolic resin and (4) a polyethylene wax having a molecular weight of about 600 to about 3000, a penetration as measured by ASTM-D 1321 of about 0.25 to about 1.5 at 25° C., and a density at 25° C. of about 0.93 to about 0.97.

23. A process for bonding low-energy plastic surfaces having a critical surface tension of about 24 to about 37 dynes per centimeter to each other which comprises; (A) heating said surfaces that will be bonded to each other to a temperature of at least about 50° C., (B) applying an adhesive composition effective in bonding low-energy plastic surfaces to each other which provides improved low temperature performance, said adhesive composition consisting essentially of: (1) a first ethylene-vinyl ester copolymer having from about 4 to 35 weight percent of a vinyl ester; (2) a second ethylene-vinyl ester copolymer having an excess of 35 weight percent of a vinyl ester; (3) a tackifier selected from the group consisting of (a) a rosin, (b) a rosin ester, (c) a terpene resin, (d) a terpene phenolic-resin and (e) a rosin-modified phenolic resin; and (4) a polyethylene wax having a molecular weight of about 600 to about 3000, a penetration as measured by ASTM-D 1321 of about 0.25 to about 1.5 at 25° C., and a density at 25° C. of about 0.93 to about 0.97, to at least one of said surfaces and wherein said adhesive composition is in a temperature range of about 140 to about 240° C. at the time of application and (C) then bringing said surfaces in contact with each other.

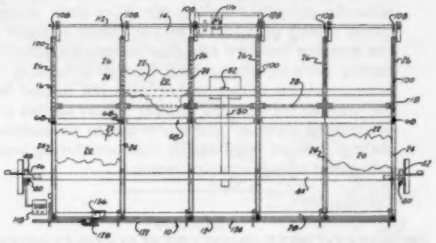
4,167,434

UNIVERSAL DRAPERY MAKING EQUIPMENT

Ronald W. Morgan, 6311 Lime Rd., Louisville, Ky. 40222

Filed Jan. 23, 1978, Ser. No. 871,612
Int. Cl.[2] B32B *31/00*; B23D *19/00*; A47F *5/12*
U.S. Cl. 156—510 **18 Claims**

1. Drapery making equipment comprising:
a. table means;
b. pivotal support means for said table means for supporting the table means in alternate fixed positions between a first generally horizontal position and a second raised position from back to front somewhere between the horizontal position and a generally vertical position;
c. first motive means for raising and lowering said table means about its pivotal support means;
d. transverse bar means movably supported with respect to the planar surface of said table means, and extending generally from one side to the other side of said table means;
e. means for attaching one edge of a drapery panel to the said transverse bar to become movable therewith;
f. second motive means for moving said transverse bar means between a first front edge position of the table means and a second position toward the rear edge of the table means;



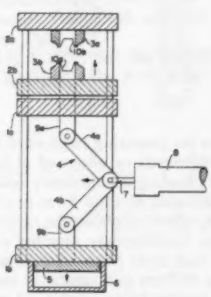
g. finishing means for forming the lower edge of the drapery panel with respect to the front edge of the table means, said finishing means serving to measure the length of the drapery panel, to cut the panel to size as well as apply a stiffening tape means along the trimmed lower edge of the panel.

4,167,435

APPARATUS FOR SEALING PLASTICS/METAL LAMINATES

Hans J. Olschewski, Berlin, Fed. Rep. of Germany, assignor to FKF Berlin Fleischwaren- und Konservenfabrik Schulz & Berndt GmbH & Co. KG, Berlin, Fed. Rep. of Germany

Division of Ser. No. 684,942, May 10, 1976, Pat. No. 4,097,318.
This application Mar. 10, 1978, Ser. No. 885,130
Claims priority, application Fed. Rep. of Germany, May 9, 1975, 2521234; Aug. 26, 1975, 2538316
Int. Cl.[2] B30B *15/34*
U.S. Cl. 156—583.1 **3 Claims**



1. An apparatus for sealing together the plastic layers of two plastic/metal laminates, comprising a stationary sealing head having a first heated sealing die disposed thereon, a movable sealing head having a second heated sealing die disposed on said movable sealing head, and drive means for bringing together said sealing heads to close the sealing dies together on said laminates, said drive means comprising:
a toggle linkage assembly having one end pivotally connected to said movable sealing head;
a constant-pressure resilient buffer means connected to the other end of said toggle linkage assembly, said buffer means including a pneumatic piston and cylinder assembly coupled to a source of compressed gas for pressurizing

said cylinder at a substantially constant pressure and having a piston rod pivotally connected to said other end of the linkage assembly;

a hydraulic actuator means drivingly connected to said toggle linkage assembly between said buffer means and said movable sealing head and adapted to drive the toggle linkage assembly so as to bring together said sealing dies on said laminates; and

said toggle linkage assembly and said buffer means permitting rapid build up of pressure between said sealing dies to a sealing pressure predetermined by said buffer means whereby once said sealing dies have been brought together during actuation of said hydraulic actuator means, the pressure between said dies increases rapidly to said sealing pressure after which further movement of said actuator means during sealing does not further increase the pressure between the dies but merely applies a yieldably-resisted force to said buffer means to maintain said sealing pressure substantially constant during continued movement of said actuator means.

4,167,436

PROCESS OF PREPARING CRYSTALS OF COMPOUNDS AND ALLOYS

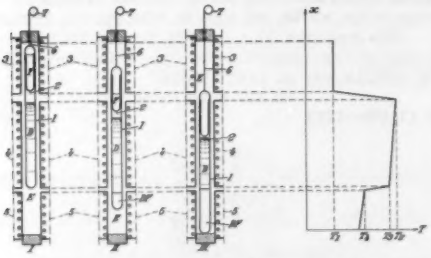
Huguette Rodot nee Fumeron; Maurice Schneider, both of 1, Place Aristide Briand, 92-Bellevue, France, and Arnost Hruby, Czechoslovak Academy of Science, Institute of Solid State Physics, Prague 6, Cukrovarnicka 10, Czechoslovakia

Continuation of Ser. No. 527,688, Nov. 27, 1974, Pat. No. 4,040,894, which is a continuation of Ser. No. 232,240, Feb. 6, 1972, abandoned, which is a continuation of Ser. No. 841,667, Jun. 13, 1968, abandoned. This application Aug. 5, 1977, Ser. No. 822,277

Claims priority, application France, Jun. 13, 1967, 67.110074

Int. Cl.[2] B01J *17/04*

U.S. Cl. 156—607 **3 Claims**



1. A process for preparing large sized crystals of substances which are compounds or alloys of at least two constituents comprising (1) feeding continuously one of said at least two constituents in liquid or solid form to the surface of a liquid phase solution which contains the other of said at least two constituents to continuously dissolve said continuously fed constituent in said liquid phase solution so that all the constituents necessary to form said substance are then present in said solution; said process being carried out in a container containing said liquid phase solution in its one end and means above said liquid phase solution for introducing said continuously fed solid or liquid constituent; (2) simultaneously subjecting said liquid phase solution to a first slight temperature gradient zone in which zone the temperature is sufficiently high to maintain said liquid phase and in which the temperature gradient is sufficiently slight to ensure gradual and homogeneous diffusion of said substance formed at said surface through said solution, the temperature of the upper surface end of said zone being higher than the lower end thereof, allowing said liquid phase to reach saturation with said substance in the lower end only of said first temperature gradient zone; (3) maintaining a second steep temperature gradient zone located beneath said first temperature gradient zone in which the temperature is lower than in said temperature gradient zone; (4) crystallizing said substance at the level of said second gradient to form a solid-liquid interface; (5) ascertaining by the application of Fick's law when saturation of the liquid phase with said substance at said solid/liquid interface is reached; (6) when said saturation is reached, moving said liquid phase relative to said first and second temperature gradients while maintaining the solid liquid interface at the same temperature and same composition within the second gradient by controlling the rate of relative movement at a speed ascertained by Fick's law and while maintaining the continuous feeding of said solid or liquid constituent; thereby (7) continuously forming and growing crystals of said substance at said interface.

4,167,437

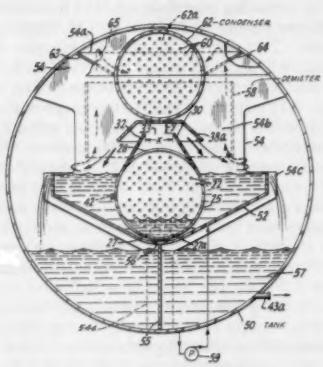
BOILING WATER EVAPORATOR WITH SHROUDED HEATING TUBE BUNDLE

Frederick W. Gilbert, Shreveport, La., assignor to Cook Electric Company, Morton Grove, Ill.

Continuation of Ser. No. 613,523, Sep. 15, 1975, abandoned, which is a continuation of Ser. No. 276,605, Jul. 31, 1972, abandoned. This application Mar. 9, 1977, Ser. No. 776,094

Int. Cl.[2] B01D *1/00*

U.S. Cl. 159—28 R **7 Claims**



1. A liquid evaporator for evaporating liquid comprising:

an elongated liquid container for containing a quantity of liquid to be evaporated,

a heating tube bundle including a plurality of tubes disposed within said liquid container, said heating tube bundle being oriented horizontally,

fluid impermeable fluid directing shroud means substantially enclosing said tube bundle,

weir means for maintaining a desired liquid level in said liquid container about said fluid impermeable fluid directing shroud means, said weir means being located in said container outside of said fluid impermeable fluid directing shroud means,

admitting means for admitting liquid from said liquid container into said fluid impermeable fluid directing shroud means at a desired rate, said admitting means and said weir means enabling the liquid level in said shroud means to be maintained below the liquid level in said liquid container outside of said shroud means and said tube bundle to be at least partially immersed in liquid,

means for passing a heating fluid through the interiors of the tubes of said tube bundle to cause liquid within said fluid impermeable fluid directing shroud means to be formed into a high velocity vapor-liquid stream,

exit nozzle means extending upwardly from the top of said fluid impermeable fluid directing shroud means, said exit nozzle means having converging means for directing said vapor-liquid stream from said fluid impermeable fluid directing shroud means,

a stream diverting means above said exit nozzle means to direct liquid from said stream back into said quantity of liquid in said container, and

withdrawing means for withdrawing the vapor of said stream from the region of the fluid impermeable fluid directing shroud means and the stream diverting means.

4,167,438

METHOD AND APPARATUS FOR PREPARING AND CLEANING FIBROUS MATERIAL

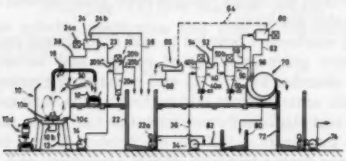
Emil Holz, Eningen unter Achalm, Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik, Fed. Rep. of Germany

Filed Jan. 10, 1978, Ser. No. 868,386

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1977, 2701737

Int. Cl.[2] D21D *5/02, 5/20, 5/22*

U.S. Cl. 162—4 **16 Claims**



1. Method of preparing and cleaning fibrous suspensions, wherein the fibre suspension is divided by sorting out into a stream of accepted stock and a stream of rejects material, whereupon the latter is subjected to a fibre flake break-up process, characterized in that the rejects material stream is sorted once more prior to the fibre flake break-up process and is concentrated and merely the rejects material resulting from the after-sorting is treated for fibre flake break-up.

2. A method of preparing and cleaning fibrous suspensions containing agglomerates of fibres, said method comprising the steps of dividing a feed stream of a fibrous suspension by screening into a first partial stream of accepted stock and a second partial stream of rejected stock; screening said second partial stream and thereby dividing the same into a third partial stream of accepted stock and a fourth partial stream of rejected stock, the latter comprising said fibre agglomerates and having a higher stock density than that third partial stream; breaking up said fibre agglomerates in said fourth partial stream and subsequently screening the same, thereby dividing it into a fifth partial stream of accepted stock and a sixth partial stream of rejected stock, and adding said fifth partial stream to said feed stream.

4,167,439

NON-IONIC, WATER-SOLUBLE POLYMERS FOR IMPROVING THE DRY-STRENGTH OF PAPER

H. Scott Killam, Holland, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 750,475, Dec. 14, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,500

Int. Cl.[2] D21H *3/38*

U.S. Cl. 162—163 **20 Claims**

1. A method of increasing the dry strength of paper which comprises incorporating in the pulp from which the paper is derived from about 0.15% to about 0.5% based on the dry paper fiber weight of a water-soluble non-ionic copolymer consisting essentially of polymerized units, in weight percent, of 5 to 30% N-vinyl pyrrolidone, 15 to 35% acrylamide, and 30 to 70% methyl methacrylate said copolymer having a viscosity of about 10 to about 500 centipoise at 10% by weight in water at 25° C., at a pH of about 4 to 8.

16. Paper made by the method of claim 1.

4,167,440

SPRAY CLEANING APPARATUS

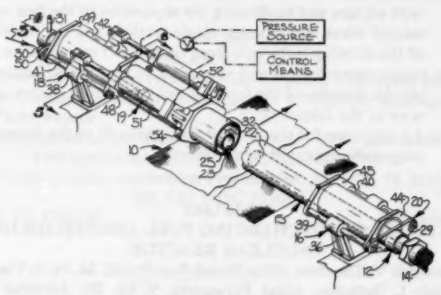
Carl H. Falk, Karlstad, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstadt, Sweden

Filed Oct. 14, 1977, Ser. No. 842,259

Claims priority, application Sweden, Oct. 18, 1976, 7611528

Int. Cl.[2] D21F *1/32, 1/34*

U.S. Cl. 162—277 **9 Claims**



1. Spray cleaning apparatus for foraminous elements of papermaking machines and the like such as wires and felts and the like, the apparatus comprising elongate spray manifold means having a plurality of nozzles for spraying liquid directly from the nozzles onto a foraminous element to be cleaned, elongate carrier means for mounting said manifold means in a position generally transverse to a path of travel of said foraminous element and having means defining at least one aperture aligned with said nozzles for accommodating delivery of sprayed liquid directly onto the foraminous element, means for supporting said carrier means for movement longitudinally and relative to said support means, drive means operatively connected with said carrier means for reciprocating said carrier means longitudinally, and easily detachable securing means for securing said manifold means in mounting engagement with said carrier means for reciprocation therewith.

4,167,441

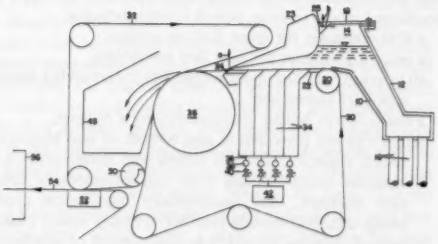
PAPERMAKING MACHINE

Martin B. Keller, Hudson Falls, N.Y., assignor to Sandy Hill Corporation, Hudson Falls, N.Y.

Filed May 3, 1978, Ser. No. 902,491

Int. Cl.[2] D21F *1/02, 1/40, 9/02*

U.S. Cl. 162—290 **3 Claims**



1. In a papermaking machine,

a headbox,

a wire system including a looped first bottom wire and a looped second top wire,

a first dewatering means located beneath the headbox,

the first wire having a single-wire section passing through the headbox and over the first dewatering means for the primary removal of water from the initially forming pulp web,

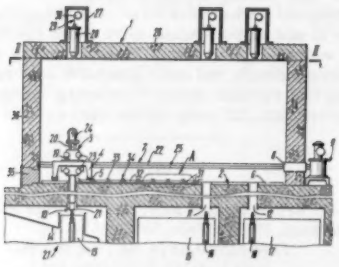
a dewatering roll outboard of the headbox,
the second wire being entrained into confrontation with the first wire through a double-wire section in the area of the descending quadrant of the dewatering roll around which the two wires are guided for the secondary removal of water from the forming pulp web through centrifugal force in a direction opposite to the direction of primary water removal,
a suction transfer roll serving as the terminus of the double-wire section and facilitating the separation of the first and second wires into separate single sections and the transfer of the forming pulp web from the first to second wire,
a vacuum transfer box and cooperant looped fabric facilitating the transfer of the forming pulp web from the second wire to the fabric,
and a saturator for the passage therethrough of the forming pulp web supported by the fabric.

4,167,442

SYSTEM FOR RECHARGING FUEL ASSEMBLIES OF NUCLEAR REACTOR

Alexandr V. Timofeev, ulitsa Strazh Revoljutsii, 24, kv. 9; Vladimir I. Batjukov, ulitsa Prygunova, 9, kv. 29; Alexandr I. Fadeev, ulitsa Engelsa, 21, kv. 46; Alexandr F. Shapkin, ulitsa Zvezdinka, 3, kv. 64; Tsolak G. Shkhiyan, naberezhnaya imeni Zhdanova, 6, kv. 16; Georgy V. Ordynsky, ulitsa Strazh Revoljutsii, 9/6, kv. 9; Viktor P. Drachev, ulitsa Lesokhimikov, 3, kv. 3, and Evgeny N. Pogodin, ulitsa Frezernaya, 17, all of Gorky, U.S.S.R.

Filed May 16, 1977, Ser. No. 797,379
Int. Cl.[2] G21C *19/20*; B66C *17/08*
U.S. Cl. 176—30 **8 Claims**



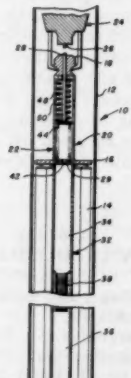
1. A system for recharging fuel assemblies of a nuclear reactor, the fuel assemblies being surrounded by coolant when positioned in the reactor, which system includes:
a first container for spent fuel assemblies;
a second container for new fuel assemblies;
an intermediary distribution chamber for receiving spent and new fuel assemblies;
a hermetically sealed chamber having a bottom;
a first channel provided in said bottom of said hermetically sealed chamber, through which said hermetically sealed chamber communicates with said intermediary distribution chamber, said intermediary distribution chamber being arranged outside said hermetically sealed chamber;
a second chamber provided in said bottom of said hermetically sealed chamber, through which the latter communicates with said first container for storing spent fuel assemblies, said first container being located outside said hermetically sealed chamber;
a third channel provided in said bottom of said hermetically sealed chamber, through which the latter communicates with said second container for storing new fuel assemblies, said second container being located outside said hermetically sealed chamber;
a guide located in a lower portion of said hermetically sealed chamber on a path along which spent fuel assemblies are transported from said first channel to said second channel;
a recharging machine located inside said hermetically sealed chamber for transporting fuel assemblies between said first, said second, and said third channels, said machine including:
a movable platform positioned for movement along said path,
a manipulator tube mounted on said movable platform,
a grip movably arranged inside said manipulator tube for gripping a fuel assembly to be transported,
a first reduction gear mounted on said movable platform for moving said manipulator tube in a vertical direction between raised and lowered positions,
a second reduction gear mounted in said manipulator tube for vertically moving said grip inside said manipulator tube, and
a third reduction gear mounted on said movable platform for moving said movable platform inside said hermetically sealed chamber, said manipulator tube being moved to the raised position prior to movement of said movable platform;
a driving mechanism coupled to said first, second and third reduction gears and located outside said hermetically sealed chamber for driving said recharging mechanism;
tank means separate from said recharging machine mounted below said platform for movement on said guide, said tank means intercepting and storing coolant falling towards said floor during transport of fuel assemblies; and
said hermetically sealed chamber having a sealed hatch through which said tank means is moved into and out of said hermetically sealed chamber.

4,167,443

SELF-ACTUATED RATE OF CHANGE OF PRESSURE SCRAM DEVICE FOR NUCLEAR REACTORS

Richard C. Noyes, New Britain; Shakir U. Zaman, Windsor, and Douglas W. Stuteville, Granby, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 30, 1977, Ser. No. 829,163
Int. Cl.[2] G21C *7/08*
U.S. Cl. 176—36 R **11 Claims**



1. In a nuclear reactor having liquid coolant passing therethrough, an apparatus for actuating a poison bundle release mechanism in response to a predetermined rate of decrease in the pressure of the coolant, comprising:
a rigid chamber located within the reactor and in restricted fluid communication with the coolant pressure near said chamber;
moveable actuating means externally attached to said cham-

ber having a movement responsive to a difference in pressure between the coolant passing near said chamber and the contents of said chamber where said actuating means is attached;

pneumatic damping means located within said chamber and associated with the coolant within said chamber and with said actuating means such that for normal rates of pressure change there is substantially no motion of said actuating means, but for an excessive rate of pressure decrease said actuating means moves sufficiently to actuate the mechanism.

4,167,444

REMOVAL OF IMPURITIES FROM THE COOLANT GAS OF GAS-COOLED HIGH TEMPERATURE NUCLEAR REACTORS

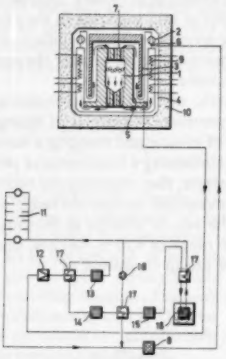
Fritz Schweiger, Hagen, Fed. Rep. of Germany, assignor to Hochtemperatur-Kernkraftwerk GmbH KG Gemeinsames Europaisches Unternehmen, Hamm-Uentrop, Fed. Rep. of Germany

Filed Dec. 15, 1976, Ser. No. 750,689

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1976, 2601460

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—37 **9 Claims**



1. In a method of removing impurities from the coolant gas of a gas-cooled high temperature pebble bed nuclear reactor including a reactor vessel defining a core and a coolant circuit, components located within said pressure vessel, and generally spherical fuel elements moving downwardly through the reactor core during reactor operation with at least some of the components and fuel elements being made predominantly of graphite which provides the moderating effect for the fission reaction and others of which include steel surfaces, said method including continuously circulating the coolant gas through the core and continuously withdrawing a part of said coolant gas from said coolant circuit and passing it through a gas purification plant, the improvement comprising the step of feeding carbon dust of colloidal particle size into said coolant gas in said coolant circuit at a location spaced from the fuel elements in the core so that the carbon dust is completely and uniformly mixed with said coolant gas in the suspended state within the reactor before flowing over the downwardly moving fuel elements in the reactor core, measuring the impurity levels within the reactor, regulating the quantity of carbon dust introduced as a function of the measured impurity levels, collecting impurities and radioactive fission products in the carbon dust within the cooling gas, removing a part of the coolant gas along with the carbon dust therein to the purification plant and separating the impurities and radioactive fission produced in the purification plant before returning the coolant gas treated in the plant back to the coolant circuit and thereby preventing corrosive reaction of the impurities with the fuel elements and graphite components and also preventing accumulation of the fission products on the steel surfaces of the components within the reactor pressure vessel.

4,167,445

NUCLEAR REACTOR

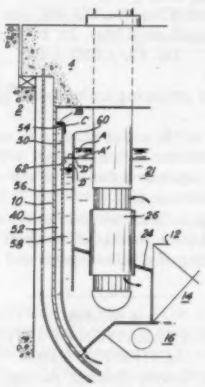
Michel Aubert, Pierrevert, and Paul Lambert, Echirolles, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 743,412, Nov. 19, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,478

Claims priority, application France, Nov. 26, 1975, 75 36226

Int. Cl.[2] G21C *15/00*

U.S. Cl. 176—65 **13 Claims**



1. A nuclear reactor comprising a vessel placed within an enclosure, a reactor vault roof for closing the top of the enclosure, said vessel being suspended from the roof, a reactor core in said vessel, the vessel being partially filled with liquid metal for cooling said core, a blanket of inert gas being located above the free surface of said liquid, means for dividing the vessel into two compartments, one for hot liquid metal and one for cold liquid metal, the reactor being further provided with means for collecting and cooling said hot liquid metal after it has passed through the reactor core and re-injecting the resultant cold liquid metal into the lower portion of said reactor vessel beneath said core, said vessel being further provided with a first cylindrical shell which forms a first annular space between said first shell and the reactor vessel, a second cylindrical shell which forms a second annular space between said second shell and the first cylindrical shell, cold liquid metal being introduced in the bottom of one of the two annular spaces and the other annular space receiving liquid metal discharging from the top of said one annular space, wherein the level of liquid metal is free within both annular spaces and wherein said first cylindrical shell which forms a separation between the two annular spaces has a top edge located above the maximum level of the liquid metal within said other annular space, the edge having a profile such that the flow of liquid metal over said edge takes place by maintaining the overflowing sheet of said liquid metal in contact along the wall of said first cylindrical shell, means for maintaining the free level of the liquid in said one of the two annular spaces above the free top edge of the first shell, and means for maintaining the free level of the liquid in said other annular space under the free top edge of the first shell.

4,167,446

WATER SOLUBLE CARRIER-BOUND PENICILLINACYLASE

Fritz Hüper, Wuppertal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 449,272, Mar. 8, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,132
Claims priority, application Fed. Rep. of Germany, Mar. 15, 1973, 2312824
Int. Cl.[2] C12D *9/00, 9/06;* C07G *7/02*
U.S. Cl. 435—45 22 Claims

1. A water-soluble non-colloidal penicillinacylase composition comprising penicillinacylase covalently bound to a cyanogen halide activated water soluble polysaccharide.

4,167,447

METHOD FOR INSOLUBILIZING ENZYMES ON CHITOSAN

Merle S. Masri, Emeryville; Virginia G. Randall, and William L. Stanley, both of El Cerrito, all of Calif., assignors to United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 706,980, Jul. 19, 1976, Pat. No. 4,089,746. This application Mar. 24, 1978, Ser. No. 889,672
Int. Cl.[2] C07G *7/02*
U.S. Cl. 435—178 9 Claims

1. A process for preparing an insoluble but active enzyme, which comprises
   (a) dissolving a solble active enzyme in water,
   (b) dissolving chitosan in water at pH 3–7,
   (c) mixing the aqueous solution of the enzyme with the solution of chitosan, and
   (d) precipitating an insoluble but active enzyme from the mixture by addition thereto of an agent selected from the group consisting of alkaline agents and sources of sulfate ions.

4,167,448

PROCESS FOR PREPARATION OF PHYSIOLOGICALLY ACTIVE PEPTIDES

Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa; Tomio Takeuchi, Tokyo, and Masa Hamada, Hoya, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Division of Ser. No. 834,635, Sep. 19, 1977, Pat. No. 4,126,606. This application Jun. 16, 1978, Ser. No. 916,184
Claims priority, application Japan, Oct. 4, 1976, 51/119089; Jul. 22, 1977, 52/88729
Int. Cl.[2] A61K *35/74;* C12D *13/06*
U.S. Cl. 435—70 2 Claims

1. A process for producing a tetrapeptide of the formula

X—Val—Val—Y I

wherein,

X represents 3-amino-2-hydroxy-5-methylhexanoyl residue or 3-amino-2-hydroxy-4-methylhexanoyl residue,

Val represents L-valyl residue, and

Y represents L-aspartic acid α-amide, L-aspartic acid or L-glutamic acid when X is 3-amino-2-hydroxy-5-methylhexanoyl residue and L-glutamic acid α-amide or L-glutamic acid when X is 3-amino-2-hydroxy-4-methylhexanoyl residue, and

the amino group of the Val adjacent to X being acylated with the carboxyl group of the X to form an amide bond, the carboxyl group of said Val acylating the amino group of the other Val to form an amide bond and the carboxyl group of the other Val acylating the amino group of the Y to form an amide bond which comprises cultivating aerobically a microorganism that is capable of producing said tetrapeptide and belongs to the genus Streptomyces in a medium suitable for growth of said microorganism to accumulate said tetrapeptide and recovering said tetrapeptide thus produced.

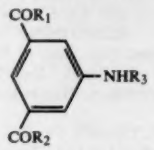
4,167,449

COMPOSITION AND METHOD FOR DETERMINING TRANSFERASE AND PROTEASE ACTIVITY

Robert J. Gargiulo, Miami, Fla., and Richard C. Driscoll, Lake Forest, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.

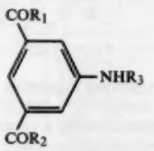
Continuation-in-part of Ser. No. 709,720, Jul. 29, 1976, abandoned. This application Aug. 5, 1977, Ser. No. 822,057
Int. Cl.[2] G01N *31/14, 33/16*
U.S. Cl. 435—16 14 Claims

1. A reagent for use in a fluorometric determination of transferase and protease activity, said reagent comprises a substrate selected from the group consisting of



wherein each of R_1 and R_2 is —OH, —NH_2, $NHCH_3$, —NHC_2H_5, —$N(CH_3)_2$, —$N(C_2H_5)_2$, —$N((CH_3)$ (C_2H_5), —OCH_3, or $O(CH_2)_nCH_3$, n is an integer of 1 through 4, and wherein R_3 is an amino acid moiety capable of being cleaved from the remainder of said substrate in the presence of a transferase or protease having activity specific to that substrate and a buffer which maintains pH at or near the optimum pH of the transferase or protease.

6. A fluorometric method for determining the activity of transferases and proteases in samples of biological fluids, comprising the steps of mixing and reacting a substrate and a sample of body fluid containing a transferase or protease capable of cleaving said substrate; then exposing the mixture to ultraviolet light having a wavelength within the range of 320 to 380 nm; and measuring the rate of change in fluorescence at a wavelength within the range of 420 to 480 nm; said substrate being selected from the group consisting of



wherein each of R_1 and R_2 is —OH, —NH_2, $NHCH_3$, —NHC_2H_5, —$N(CH_3)_2$, —$N(C_2H_5)_2$, —$N(CH_3)$ (C_2H_5), —OCH_3, or $O(CH_2)_nCH_3$, n is an integer of 1 through 4, and wherein R_3 is an amino acid moiety capable of being cleaved from the remainder of said substrate in the presence of a transferase having activity specific to that substrate.

4,167,450

METHOD AND APPARATUS FOR THE PRODUCTION OF SECONDARY METABOLITES BY THE MAINTENANCE-STATE CULTIVATION OF MICROORGANISMS

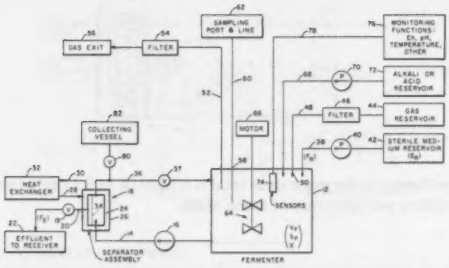
William R. Chesbro, Newmarket; Robin Eifert, Durham, and Thomas Evans, Dover, all of N.H., assignors to University of New Hampshire, Durham, N.H.

Filed Jul. 13, 1977, Ser. No. 815,079
Int. Cl.[2] C12D *1/00, 3/00;* C12B *1/00*
U.S. Cl. 435—3 14 Claims

1. A method of growing and maintaining a culture of microorganisms in a state wherein greater than 90 percent of the energy source available to the culture is utilized for maintenance energy, comprising the steps of

providing in a closed system comprising a vessel connected

to a filtration means in a manner which allows the continuous withdrawal of filtrate free of cells from the system, an initial fluid medium seeded with cells of selected microorganisms, the medium containing nutrient material comprising a source of maintenance energy for the cells, and initially cultivating the cells causing the mass of said cells to increase and the concentration of said source to decrease,



introducing additional medium containing said source at a volume rate F_R into the vessel as said mass is increasing wherein the volume rate is controlled so that the product of the rate F_R and the energy substrate concentration S_R of said source is constant, and further cultivating the cells until the rate of increase of said mass is progressively reduced to a minimum and a concentration of cells, X_m, is obtained which satisfies the following relationship

$$X_m = \frac{F_R}{V_F}\left[\frac{S_R - (S_F + S_A)}{M_c}\right]$$

thereby achieving said state, wherein X_m is the cell mass per unit fluid volume in said system, V_F is the fluid volume in said system, S_F is the concentration of said source in said system, S_A is the amount of said source assimilated into the cells per unit fluid volume in said system, and M_c is a coefficient relating the rate of utilization of the energy source for maintenance energy to the cell mass, and wherein S_F is permitted to decrease substantially to zero upon the cells reaching said state,

filtering a portion of the medium in the system and products of metabolism therein from the cells, said portion being free of cells, and

transferring said portion at a rate F_S to a receiver.

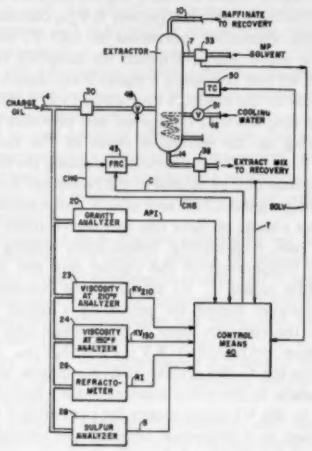
4,167,451

N-METHYL-2-PYRROLIDONE REFINING UNIT CONTROL SYSTEM

Avilino Sequeira, Jr., and Frank L. Barger, both of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,895
Int. Cl.[2] C10G *21/00*; C06G *7/58*
U.S. Cl. 196—14.52 **14 Claims**

1. A control system for a refining unit receiving charge oil and N-methyl-2-pyrrolidone solvent, one of which is maintained at a fixed flow rate while the flow rate of the other is controlled by the control system, treats the received charge oil with the received N-methyl-2-pyrrolidone to yield extract and raffinate, comprising gravity analyzer means for sampling the charge oil and providing a signal API corresponding to the API gravity of the charge oil, viscosity analyzer means for sampling the charge oil and providing signals KV_{150} and KV_{210} corresponding to the kinematic viscosities, corrected to 150° F. and 210° F., respectively, sulfur analyzer for sampling the charge oil and providing a signal S corresponding to the sulfur content of the charge oil, a refractometer samples the charge oil and provides a signal RI corresponding to the refractive index of the charge oil, flow rate sensing means for sensing the flow rates of the charge oil and of the N-methyl-2-pyrrolidone and providing signals CHG and SOLV, corresponding to the charge oil flow rate and the N-methyl-2-pyrrolidone flow rate, respectively, means for sensing the temperature of the extract-mix and providing a corresponding signal



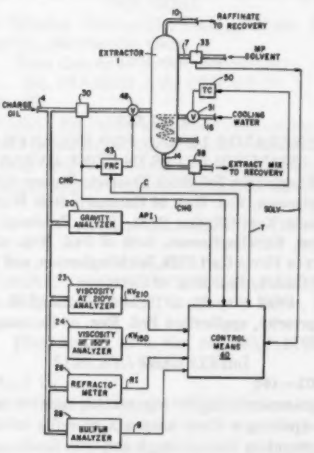
T, and control means connected to all of the analyzer means, the refractometer, and to all the sensing means for controlling the other flow rate of the charge oil and the N-methyl-2-pyrrolidone flow rates in accordance with signals API, KV_{150}, KV_{210}, S, RI, CHG, T and SOLV.

4,167,452

CONTROL SYSTEM FOR AN N-METHYL-2-PYRROLIDONE REFINING UNIT RECEIVING MEDIUM SOUR CHARGE OIL

Avilino Sequeira, Jr., and Frank L. Barger, both of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,896
Int. Cl.[2] C10G *21/00*; C06G *7/58*
U.S. Cl. 196—14.52 **9 Claims**



1. A control system for an N-methyl-2-pyrrolidone refining unit receiving medium sour charge oil and N-methyl-2-pyrrolidone solvent, one of which is maintained at a fixed flow rate while the flow rate of the other is controlled by the control

system, treats the received medium sour charge oil with the received N-methyl-2-pyrrolidone to yield extract mix and raffinate, comprising gravity analyzer means for sampling the medium sour charge oil and providing a signal API corresponding to the API gravity of the medium sour charge oil, viscosity analyzer means for sampling the medium sour charge oil and providing signals KV_{150} and KV_{210} corresponding to the kinematic viscosities, corrected to 150° F. and 210° F., respectively, sulfur analyzer means for sampling the medium sour charge oil and providing a signal S corresponding to the sulfur content of the medium sour charge oil, a refractometer samples the medium sour charge oil and provides a signal RI corresponding to the refractive index of the medium sour charge oil, flow rate sensing means for sensing the flow rates of the medium sour charge oil and of the N-methyl-2-pyrrolidone and providing signals CHG and SOLV, corresponding to the medium sour charge oil flow rate and the N-methyl-2-pyrrolidone flow rate, respectively, temperature sensing means for sensing the temperature of the extract mix and providing a corresponding signal T, VI signal means connected to the viscosity analyzer means for providing a signal VI, corresponding to the viscosity index of the medium sour charge oil, in accordance with signals KV_{150} and KV_{210}, ΔVI signal means connected to the gravity analyzer means, to the sulfur analyzer means, to the refractometer, to the viscosity analyzer means and to the VI signal means for providing a signal ΔVI corresponding to a difference between the viscosities of the medium sour charge oil and the refined oil in accordance with signals S, API, KV_{210}, RI and VI, ΔRI signal means connected to the gravity analyzer means, to the sulfur analyzer means, to the viscosity analyzer means, and to the ΔVI signal means for providing a signal corresponding to the difference between the refractive indexes of the medium sour charge oil and the refined oil, J signal means connected to the VI signal means, to the temperature sensing means, to the viscosity analyzer means, to the sulfur analyzer means, to the ΔRI signal means and to the ΔVI signal means for providing a signal J, corresponding to the N-methyl-2-pyrrolidone dosage, and control means connected to the J signal means and to the flow rate sensing means for providing a control signal in accordance with the J signal and one of the sensed flow rate signals, and apparatus means connected to the control means for controlling the one flow rate of the medium sour charge oil and N-methyl-2-pyrrolidone flow rates in accordance with the control signal.

4,167,453

REGENERATOR LINING FOR REGENERATOR CHAMBER CELLS IN COKE OVENS

Johannes Knappstein; Friedrich Thiersch; Werner Schuch, all of Recklinghausen, Fed. Rep. of Germany; Rolf Weber, Hamilton, Canada; Kurt-Günther Beck, Essen, Bredeney, and Dieter Stahlherm, Recklinghausen, both of Fed. Rep. of Germany, assignors to Firma Carl Still, Recklinghausen, and Bergwerksverband GmbH, Fed. Rep. of Germany

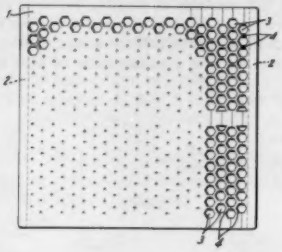
Filed May 28, 1975, Ser. No. 581,555

Claims priority, application Fed. Rep. of Germany, May 30, 1974, 2425931

Int. Cl.[2] C10B *1/06, 5/12*

U.S. Cl. 202—141 **6 Claims**

1. A regenerator lining for regenerator chamber cells in coke ovens, comprising a stone having a plurality of internal gas passages extending therethrough and side frame portions and top and bottom surfaces with openings for the gas passages and including wall formations between the openings, said frame portions having a material thickness of up to 20 mm, said wall formations between openings being up to 10 mm in thickness and said passages and openings being up to 16 mm wide and no less than a size to permit flow the gases therethrough, the specific ratio of the stone surface participating in the heat



exchange to the stone mass total is from 0.08 to 0.12 m^2 of stone surface per kilogram of stone mass.

4,167,454

EVAPORATOR

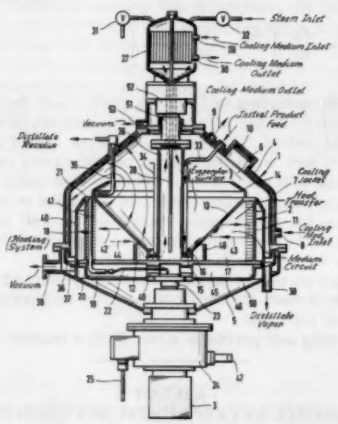
Vaclav Feres, Haid-und neu-Strasse 14, D-7500 Karlsruhel, Fed. Rep. of Germany

Filed Jan. 24, 1977, Ser. No. 762,149

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1976, 2603480; Dec. 21, 1976, 2657956

Int. Cl.[2] B01D *1/22*

U.S. Cl. 202—236 **26 Claims**



1. A thin-layer evaporator, more especially for high-boiling products, comprising:

a vapour chamber;

a rotor rotatable therein, the said rotor comprising a sealed chamber for a liquid heat-transfer medium circuit that is closed upon itself;

an evaporator surface separating this liquid heat-transfer medium circuit from the vapour chamber, said evaporator surface forming part of the sealed chamber; and

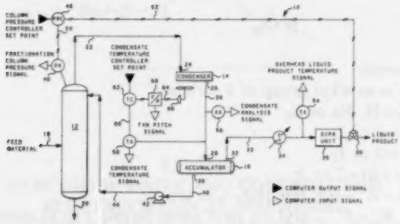
a heat system for the liquid heat-transfer medium, which heating system is in direct contact with such medium only while such medium is thrown outwardly by centrifugal force produced by the rotor and which heating system is arranged on the periphery of the sealed chamber

whereby the liquid heat-transfer medium circuit comprises a phase shift of the liquid heat-transfer medium from evaporation by the heating system to condensation adjacent the evaporator surface and back again.

4,167,455
FLOATING PRESSURE CONTROL OF FRACTIONATOR SYSTEM

William B. Bard, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Oct. 19, 1978, Ser. No. 952,914
Int. Cl.[2] B01D *3/42*
U.S. Cl. 203—2 14 Claims



1. Apparatus comprising:

fractionation column means for receiving at least one feed material stream and delivering an overhead product vapor stream from the top portion thereof;

pressure transducer means for sensing the pressure within said fractionation column means and delivering a fractionation column pressure signal representative of the thus sensed pressure;

first conduit means in flow communication with the top portion of said fractionation column means for providing a path for flow of said overhead product vapor stream therethrough;

condenser means in flow communication with said first conduit means for providing a path for flow of said overhead product stream therethrough and condensing at least a portion of said overhead product vapor stream passing therethrough so as to provide an overhead product condensate stream emanating from said condenser means;

variable pitch condenser fan blade means for directing air over said condenser means;

second conduit means in flow communication with said condenser means for providing a path for flow of said overhead product condensate stream therethrough;

first temperature transducer means for sensing the temperature of said overhead product condensate stream and delivering a condensate temperature signal representative of the thus sensed temperature;

analyzer means for analyzing the composition of said overhead product and delivering an analysis signal representative of the thus analyzed composition of said overhead product components;

accumulator means having an inlet port and at least one outlet port, said inlet port being in flow communication with said second conduit means for receiving said overhead product condensate stream and accumulating a quantity of said overhead product condensate therein;

third conduit means in flow communication with an outlet port of said accumulator means for providing a path for flow of overhead product condensate, said third conduit means including control valve means interposed therein for controlling the flow of overhead product condensate therethrough so as to control the fractionation column pressure;

fourth conduit means in flow communication with an outlet port of said accumulator means and in flow communication with said fractionation column means for providing a path for flow of overhead product condensate from said accumulator means to said fractionation column means;

pressure controller means operatively connected to said control valve means and responsive to a column pressure controller set point signal and to said fractionation column pressure signal for controlling said control valve means;

means responsive to said fractionation column pressure signal and to said analysis signal for determining the bubble point temperature of said overhead product stream and delivering a bubble point temperature signal representative of the thus determined bubble point temperature;

means responsive to said condensate temperature signal and to said bubble point temperature signal for determining the difference between the determined bubble point temperature and the overhead product condensate stream temperature and delivering a temperature difference signal representative of the thus determined difference between the determined bubble point temperature and the overhead product condensate stream temperature;

condensate temperature controller means operatively connected to said variable pitch condenser fan blade means and responsive to a condensate temperature controller set point signal and to said condensate temperature signal for controlling the pitch of said variable pitch condenser fan blade means;

means responsive to a degrees subcooling set point signal representative of a desired margin of subcooling of said overhead product condensate stream and to said temperature difference signal for determining a desired condensate temperature controller set point and delivering a condensate temperature controller set point signal representative of the thus determined condensate temperature controller set point to said condensate temperature controller means;

fan pitch transducer means responsive to said variable pitch condenser fan blade means for sensing the pitch thereof and delivering a fan pitch signal representative of the thus sensed pitch; and

means responsive to a percentage of maximum fan pitch set point signal representative of a desired percentage of maximum pitch of said variable pitch condenser fan blade means and to a fan pitch signal from said fan pitch transducer means for determining a desired column pressure controller set point and delivering a column pressure set point signal representative of the thus determined column pressure controller set point to said pressure controller means.

4,167,456
EXTRACTIVE DISTILLATION TO SEPARATE CYCLOHEXYLBENZENE FROM PHENOL-CYCLOHEXANONE MIXTURE CONTAINING THE SAME

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.

Filed Oct. 6, 1978, Ser. No. 949,287
Int. Cl.[2] B01D *3/40*; C07C *37/38*
U.S. Cl. 203—63 5 Claims

1. An extractive distillation separation of cyclohexylbenzene from a mixture containing it, cyclohexanone and phenol which comprises subjecting said mixture to extractive distillation conditions employing as a solvent in said distillation a diaryl ether.

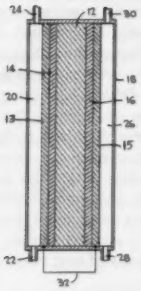
4,167,457
PASSIVE ELECTROLYTIC SEPARATOR

Jose D. Giner, Waltham, Mass., assignor to Giner, Inc., Waltham, Mass.

Filed May 5, 1978, Ser. No. 903,213
Int. Cl.[2] G01N *27/00*
U.S. Cl. 204—1 T 31 Claims

1. Process for the passive electrolytic separation of a gas from a mixture of gases comprising (1) providing a passive electrolytic cell including first and second electrodes, an ion-transfer material between said electrodes, and means for short-circuiting said cell; (2) feeding a mixture of gases to said first electrode of said passive electrolytic cell while maintaining said cell in the short-circuited mode; (3) maintaining a differential in the partial pressure of the gas to be separated from the

gaseous mixture across said electrodes of said electrolytic cell in order that said first electrode is at a higher partial pressure



than said second electrode; and (4) removing the gas to be separated from said cell.

4,167,458

LITHIUM ION-CONTAINING ORGANIC ELECTROLYTE

Demetrios V. Louzos, Rocky River, and Ralph J. Brodd, Parma Heights, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Mar. 28, 1978, Ser. No. 890,971
Int. Cl.[2] C25D *3/54*; C25C *1/22*
U.S. Cl. 204—14 N **10 Claims**

1. A solvent-electrolyte for use in a lithium electrodeposition process comprising an ionizable solute of lithium fluoroborate dissolved in a solvent mixture of methylene chloride and at least one additional solvent selected from the group consisting of sulfolane and the alkyl-substituted derivatives thereof.

4,167,459

ELECTROPLATING WITH NI-CU ALLOY

Agnes Y. Lee, Rolla; Wilbert L. Falke, St. James, and Alfred E. Schwaneke, Rolla, all of Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 8, 1979, Ser. No. 1,818
Int. Cl.[2] C25D *3/56, 3/58*
U.S. Cl. 204—44 **5 Claims**

1. A process for electrodeposition of nickel-copper alloy on a metallic substrate comprising:

(a) providing an electrolyte bath consisting essentially of an aqueous solution of nickel acetate, copper acetate and boric acid,

(b) providing in said bath a cathode consisting essentially of said metallic substrate,

(c) providing in said bath an anode consisting essentially of nickel, copper or nickel-copper alloy, and

(d) applying between said anode and cathode a d.c. current of sufficient magnitude and duration to form an adherent, corrosion resistant coating of nickel-copper alloy on the substrate.

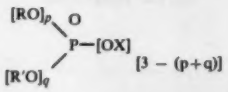
4,167,460

TRIVALENT CHROMIUM PLATING BATH COMPOSITION AND PROCESS

Thaddeus W. Tomaszewski, Dearborn, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Filed Apr. 3, 1978, Ser. No. 892,581
Int. Cl.[2] C25D *3/06*
U.S. Cl. 204—51 **12 Claims**

1. An aqueous acidic trivalent chromium electroplating solution containing about 0.2 to about 0.6 molar trivalent chromium, a chromium complexing agent in an amount effective to complex chromium in said bath, a reducing agent for hexavalent chromium in an amount sufficient to prevent hexavalent chromium build-up to levels detrimental to the plating deposit, a mono-, di- or tri-ester phosphate anionic or non-ionic surface active agent selected from the class corresponding to the following structural formula:



Wherein:

R′=an alkyl group of 8 carbons;

X=H, Na or K;

p=1 or 2;

q=0 or 1;

(p+q)=2 or 3;

R=R″—(OCH_2CH_2)—$_n$ in which;

R″=R‴—aryl, an alkyl group having 1 to 10 carbons, or H;

R‴=an alkyl group having 1 to 10 carbons or H; and

n=0–12

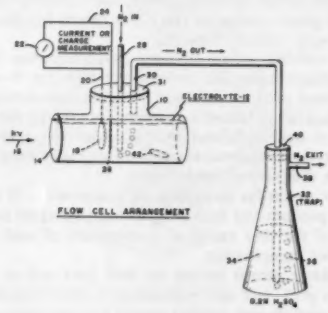
which surface active agent is present in amount sufficient to improve the efficiency of the electroplating bath and enhance the uniformity of the chromium deposit.

4,167,461

PHOTOENHANCED REDUCTION PROCESS

C. R. Dickson, Dover, and A. J. Nozik, Summit, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 10, 1978, Ser. No. 922,941
Int. Cl.[2] C25B *1/00*
U.S. Cl. 204—102 **12 Claims**



1. In a process for the reduction of nitrogen molecules bound to complexes and capable of being reduced, the improvement comprising:

providing a source of electrons comprising a p-type semiconductor cathode having a band gap between about 0.8 and 3 eV in contact with an electrolyte solution containing nitrogen molecules bound to complexes and capable of being reduced;

irradiating the cathode with light having photons of an energy of between about 0.8 and 3 eV;

injecting electrons generated by the incident light on the cathode surface into the electrolyte solution in contact with the cathode surface for reducing the nitrogen molecules bound to complexes and capable of being reduced;

providing protons to the reduced nitrogen complexes; and

providing an anode in contact with said electrolyte solution and electrically connected to said cathode; and

eliminating electronic holes generated in the cathode and

traveling to the anode via said electrical connection with electrons generated by an oxidation reaction at the anode.

10. The process of claim 1 wherein molecular nitrogen is bubbled through the electrolyte solution near the cathode.

11. The process of claim 1 wherein a protonated nitrogen dervative is formed.

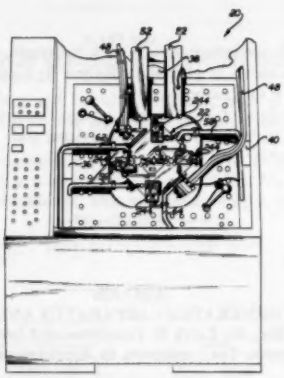
12. The process of claim 11 wherein the protonated nitrogen derivative is ammonia, hydrazine, or hydrazoic acid.

4,167,462

ELECTRODE DRIVE AND CONTROLS FOR ELECTROCHEMICAL MACHINING

Gustav E. Schrader, Pepper Pike; Karl Scheucher, Willoughy, both of Ohio; William S. Cornyn, Rancho Palos Verdes, and Robert E. Rea, Torrance, both of Calif., assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 14, 1977, Ser. No. 787,596
Int. Cl.[2] B23P *1/04, 1/14*
U.S. Cl. 204—129.25 **62 Claims**



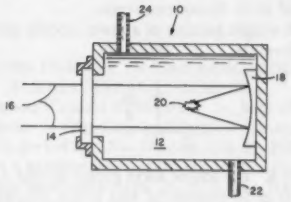
1. An apparatus for use in electrolytically removing material from a workpiece which is at least partially composed of an electrically conductive material, said apparatus comprising a plurality of movable electrode means for use in effecting the electrolytic removal of material from the workpiece, means for establishing an electrical potential between the workpiece and said plurality of electrode means, means for directing a flow of electrolyte between the workpiece and said plurality of electrode means, electrode drive means for moving each of said electrode means through a working stroke extending from a beginning of stroke position to an end of stroke position while an electrical potential is established between each of said electrode means and the workpiece and while electrolyte is flowing between each of said electrode means and the workpiece to effect the electrolytic removal of material from the workpiece during movement of said electrode means through their working strokes, and control means for interrupting movement of each of said electrode means when each of said electrode means arrives at a predetermined intermediate position disposed between the beginning of stroke and end of stroke positions and for initiating simultaneous movement of each of said electrode means from its intermediate position toward its end of stroke position under the influence of said electrode drive means after each of said electrode means has arrived at its intermediate position.

4,167,463

NITROGEN FIXATION WITH A HIGH ENERGY LASER

Raymond W. Conrad, Russellville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1978, Ser. No. 895,837
Int. Cl.[2] B01J *1/10;* B01K *1/00*
U.S. Cl. 204—157.1 R **8 Claims**



4. A method for fixing nitrogen which employs a high energy repetitively-pulsed laser radiation source that is capable of producing plasmas in gases in a reaction chamber wherein said plasma has a sufficiently high temperature to form high concentrations of nitric oxide, said method comprising:

(i) introducing a gas mixture comprising nitrogen and oxygen into a reaction chamber fitted with a first inlet and an outlet means and adapted for operating at an elevated pressure;

(ii) admitting laser radiation wavelength in an expanded beam through a second inlet means to said reaction chamber, said laser radiation being admitted in an expanded beam which has irradiance at said second inlet means that is sufficiently low to prevent damage to said second inlet means which is a window transparent to said laser radiation wavelength;

(iii) collecting said expanded beam and focusing said expanded beam with a focusing means which is a parabolic focusing mirror to yield an irradiance which is sufficient to produce a plasma at the focal point of said parabolic focusing mirror;

(iv) producing a plasma each time said high energy repetitively-pulsed laser radiation source is pulsed to form high concentrations of nitric oxide in said plasma and in a resulting reacted gas mixture, said nitric oxide being rapidly quenched to a lower temperature to prevent decomposition thereof, said quenching effected by rapid decay of said plasma following termination of laser pulse, said rapid decay of said plasma achieved by the mechanism of recombination and the rapid expansion of said plasma into the surrounding cool gas;

(v) adjusting the flow rate of said introduced gas mixture and said reacted gas mixture to maximize the yield of said nitric oxide in said reacted gas mixture which is to be extracted to yield said nitric oxide, and,

(vi) extracting said reacted gas mixture to effect removal of the nitric oxide present in said extraction reacted gas mixture.

4,167,464

PHOTOPOLYMERIZED HYDROPHILIC INTERPOLYMERS OF UNSATURATED CARBOXYLIC ACID AND ESTERS

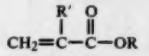
Paul J. George, Richfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 16, 1978, Ser. No. 951,906
Int. Cl.[2] C08F *2/46, 4/00*
U.S. Cl. 204—159.23 **11 Claims**

1. An interpolymer prepared by photopolymerization of:

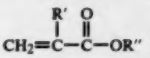
(a) 50 to 90 weight percent of acrylic acid, 70 to 100% of the carboxylic groups having been neutralized with an alkali metal or ammonium base prior to polymerization.

(b) 2 to 25 weight percent of a higher acrylic ester monomer of the formula



wherein R′ is hydrogen, methyl or ethyl and R is an alkyl group of 10 to 30 carbon atoms,

(c) 5 to 30 weight percent of a lower acrylic ester monomer of the formula



wherein R″ is a lower alkyl group having 1 to 8 carbon atoms, 0 to 50 percent of said lower acrylic ester being replaced by acrylic or methacrylic nitrile or amide, and

(d) 0.01 to 5 weight percent of a photoinitiator.

4,167,465

UNSATURATED HYDANTOIN COAGENTS

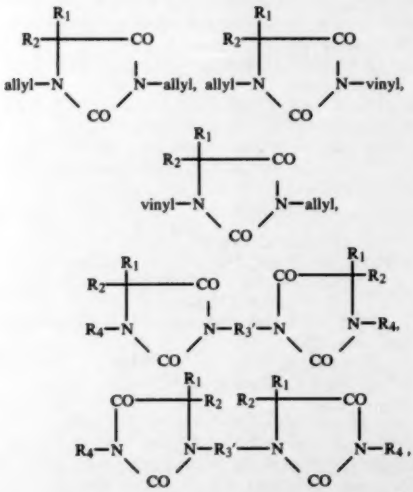
Hyman W. Zussman, Greenwich, Conn.; Martin Knell, Ossining, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 711,200, Aug. 4, 1976, Pat. No. 4,091,223. This application Mar. 13, 1978, Ser. No. 886,205

Int. Cl.[2] C08F *8/00*; C07G *233/74*

U.S. Cl. 204—159.15 **28 Claims**

1. A curable polymeric composition comprising, per 100 parts by weight of, an essentially saturated polymer or a mixture of said polymers capable of being cured at elevated temperature in the presence of 1 to 10 parts by weight of an organic peroxide or of being cured without peroxide by radiation at ambient temperature, and from 0.1 to 10 parts by weight of an unsaturated hydantoin of the formula selected from the group consisting of



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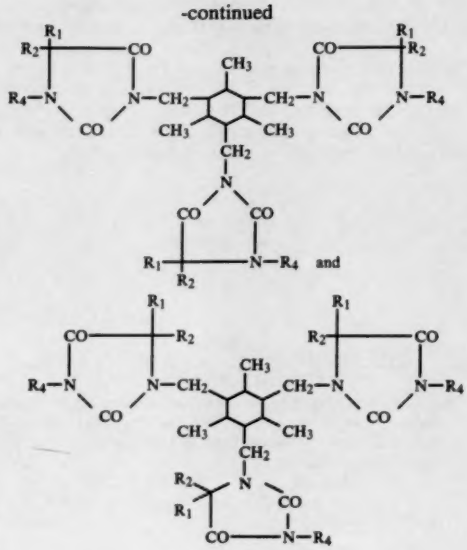


wherein

R_1 and R_2 are independently each hydrogen, alkyl of 1 to 6 carbon atoms or phenyl, or R_1 and R_2 together are alkylene of 4 to 6 carbon atoms,

R_3' is alkylene of 1 to 6 carbon atoms, 3-oxapentamethylene, 2-allyloxytrimethylene or p-xylylene, and

R_4 is vinyl or allyl.

4,167,466

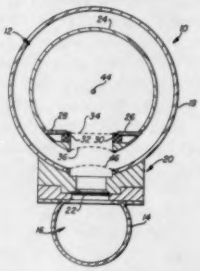
OZONE GENERATION APPARATUS AND METHOD

F. Donald Orr, Jr.; Larry F. Templeton, and Larry L. Keutzer, all of Austin, Tex., assignors to Accelerators, Inc., Austin, Tex.

Continuation-in-part of Ser. No. 754,615, Dec. 27, 1976, Pat. No. 4,095,115. This application Apr. 28, 1978, Ser. No. 900,845

Int. Cl.[2] B01K *1/00*; C01B *13/10*

U.S. Cl. 204—176 **3 Claims**



1. A method of generating ozone, comprising the steps of:

generating a diffuse electron beam having a dc level electron energy of between about 100 to about 180 kilovolts; and

directing the electron beam into an oxygen-containing atmosphere moving at a velocity of at least about 4000 feet per minute and less than supersonic velocity.

4,167,467
CLINICAL PROCEDURE FOR MEASURING LIPOPROTEIN FREE CHOLESTEROLS

Tipton L. Golias, Beaumont, Tex., assignor to Helena Laboratories Corporation, Beaumont, Tex.

Continuation-in-part of Ser. No. 835,387, Sep. 21, 1977, Pat. No. 4,105,521. This application Jul. 26, 1978, Ser. No. 928,044

Int. Cl.[2] G01N *27/26, 33/16*

U.S. Cl. 204—180 S **12 Claims**

1. A method of simultaneously determining the concentrations of high density lipoprotein free cholesterol, very low density lipoprotein free cholesterol and low density lipoprotein free cholesterol in a sample of body fluid, comprising the steps of:

(a) applying a small sample of said body fluid to be tested to a solid electrophoresis support media strip,

(b) applying a direct current for a predetermined period of time to said support media until the high density, very low density and low density lipoprotein free cholesterols have separated on the media,

(c) applying a developing substrate sensitive to small concentrations of free cholesterol to the electrophoresed lipoprotein strip, and

(d) quantitatively determining the concentrations of high density lipoprotein, very low density lipoprotein and low density lipoprotein free cholesterols in said body fluid sample from the developed electrophoresed sample.

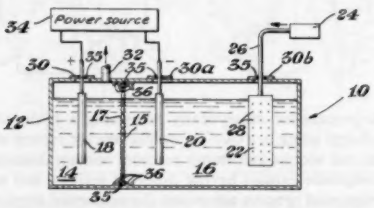
4,167,468
APPARATUS FOR ELECTROWINNING MULTIVALENT METALS

Paul R. Juckniess, and David R. Johnson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 722,916, Sep. 13, 1976, Pat. No. 4,116,801, which is a continuation-in-part of Ser. No. 517,567, Oct. 24, 1974, abandoned. This application Aug. 7, 1978, Ser. No. 931,225

Int. Cl.[2] C25C *3/14, 3/22, 3/26, 7/04*

U.S. Cl. 204—247 **29 Claims**



1. An electrolytic diaphragm cell for the production of a multivalent metal in a molten salt bath comprising:

a body adapted to contain the bath and to separate the bath from the ambient atmosphere;

an anode compartment disposed within said body;

a deposition cathode compartment disposed within said body and spaced apart from said anode compartment by a diaphragm;

at least one anode, adapted to be at least partially immersed in the bath, disposed within said anode compartment;

at least one deposition cathode, adapted to be at least partially immersed in the bath, disposed within said cathode compartment;

at least one foraminous diaphragm with at least a surface portion consisting essentially of cobalt, the surface portion being of a sufficient size to function as a diaphragm in the cell and having a diaphragm coefficient of greater than zero to about 0.5 and a flow coefficient within the range of from about 0.1 to about 25, the diaphragm being adapted to be at least partially immersed in the bath to space apart said anode and cathode compartments;

at least one feed means adapted to provide multivalent metal ions to the bath;

a means to remove a gas from said anode compartment; and

a means to provide sufficient electrical energy to said anode and said cathode to deposit solid multivalent metal on said cathode.

4,167,469
DIAPHRAGMS FOR USE IN THE ELECTROLYSIS OF ALKALI METAL CHLORIDES

Igor V. Kadija, and Kenneth E. Woodard, Jr., both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 736,805, Oct. 29, 1976, Pat. No. 4,081,350, and a continuation-in-part of Ser. No. 881,291, Feb. 27, 1978. This application Mar. 28, 1978, Ser. No. 891,104

The portion of the term of this patent subsequent to Mar. 28, 1995, has been disclaimed.

Int. Cl.[2] C25B *13/04*

U.S. Cl. 204—296 **14 Claims**

1. A diaphragm for use in the electrolysis of alkali metal chloride brines which comprises a cohesive body formed of a mixture of sand and a polyolefin binding agent, said polyolefin is selected from the group consisting of olefins having from 2 to about 6 carbon atoms and their chloro- and fluoro- derivatives, said sand having a particle size smaller than about 40 mesh and larger than about 500 mesh.

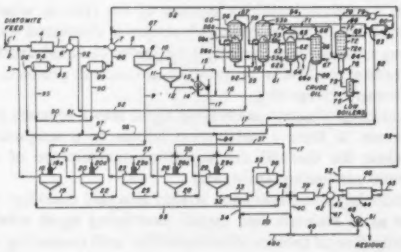
4,167,470
PROCESS AND APPARATUS FOR SOLVENT EXTRACTION OF OIL FROM OIL-CONTAINING DIATOMITE ORE

George B. Karnofsky, 1163 Firwood Dr., Pittsburgh, Pa. 15243

Filed May 15, 1978, Ser. No. 905,861

Int. Cl.[2] C10G *17/00*

U.S. Cl. 208—8 LE **17 Claims**



1. A process for continuous extraction of oil from diatomite ore with a hydrocarbon solvent comprising:

(a) mixing oil-containing diatomite ore and a second miscella previously produced in the operation of the process to form a slurry;

(b) charging the slurry to a settling zone wherein a first miscella, containing oil and solvent and ore fines, is separated from the diatomite;

(c) contacting said separated diatomite with solvent in a plurality of countercurrent extraction stages and extracting oil therefrom, and separating a second miscella, containing oil and solvent, from spent diatomite containing residual solvent;

(d) returning the second miscella to step (a) for mixing with oil-containing diatomite ore;

(e) intimately mixing the spent diatomite containing residual solvent with water;

(f) separating the mixture so formed into two phases, a heavier phase comprising an aqueous slurry of spent diato-

mite containing a minor amount of solvent and a lighter solvent phase;

(g) stripping the minor amount of solvent from said aqueous slurry of spent diatomite as a first vapor by contact with steam at superatmospheric pressure;

(h) condensing the mixture of first solvent vapor and steam removed by said stripping and separating the condensate into water and recovered solvent phases;

(i) evaporating solvent from said first miscella as a second solvent vapor, to recover substantially solvent free oil;

(j) condensing the second solvent vapor; and

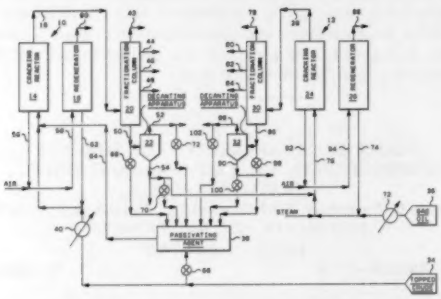
(k) returning said lighter solvent phase of step (f) and the first and second condensed solvent vapors to the countercurrent extraction stages.

4,167,471

PASSIVATING METALS ON CRACKING CATALYSTS

Brent J. Bertus, and Dwight L. McKay, both of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Jul. 31, 1978, Ser. No. 929,479
Int. Cl.[2] C10G *11/06, 9/16;* B01J *8/24*
U.S. Cl. 208—74 **26 Claims**



1. In a catalytic cracking process of the type in which a preheated hydrocarbon feedstock stream is contacted with a cracking catalyst in a cracking zone under elevated cracking temperature conditions to produce a cracked product, the improvement comprising:

introducing a metals passivating agent into a separate fluid stream to form a passivation stream at a temperature below the thermal decomposition temperature of said metal passivating agent; and

introducing said passivation stream into said cracking zone so as to maintain said metals passivating agent substantially free of thermal decomposition until contacting said cracking catalyst so as to passivate metals contaminating said cracking catalyst.

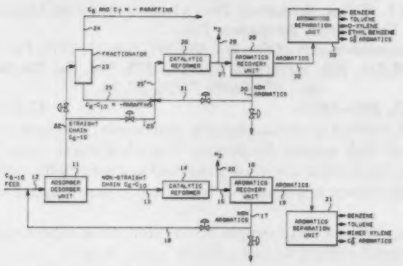
4,167,472

HYDROCARBON TREATING PROCESS

James E. Dick; Fred T. Sherk, and Lewis E. Drehman, all of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Apr. 26, 1978, Ser. No. 900,390
Int. Cl.[2] C07C *5/40, 15/02;* C10G *39/00*
U.S. Cl. 208—80 **19 Claims**

1. A process for treating a hydrocarbon composition containing both straight chain and non-straight chain hydrocarbons comprising separating said hydrocarbon composition into a straight chain hydrocarbon-rich fraction and a non-straight chain hydrocarbon-rich fraction, converting non-aromatics in said non-straight chain hydrocarbon-rich fraction to aromatics to obtain a first aromatics-containing stream, and passing at least a portion of the straight chain hydrocarbon-rich fraction in combination with steam over a steam active catalyst comprising at least one Group VIII metal and a tin modified Group



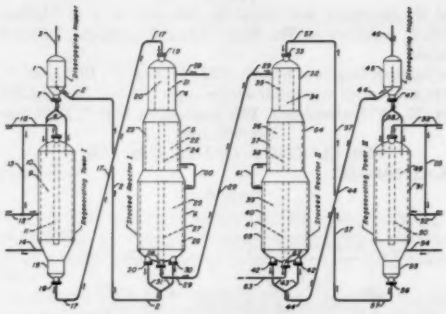
II metal aluminate under conditions such that a second aromatics-containing stream is produced.

4,167,473

MULTIPLE-STAGE CATALYTIC REFORMING WITH GRAVITY-FLOWING DISSIMILAR CATALYST PARTICLES

John G. Sikonia, La Grange, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 809,970, Jun. 27, 1977, abandoned. This application May 2, 1978, Ser. No. 902,461
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—140 **9 Claims**



1. A process for catalytically reforming a hydrocarbonaceous charge stock in a two-reforming reactor system wherein the first and second reforming reactors contain discrete catalytic composite entities having different activity and stability properties, said process comprises the sequential steps of:

(a) reacting said hydrocarbonaceous charge stock and hydrogen in contact with the first of said discrete catalytic composite entities comprising a Group VIII metal, a catalytic metal modifier, and a halogen component disposed in said first of said two reforming reactors on a porous support material through which said first catalytic entity is downwardly movable via gravity-flow to produce a first reforming reactor effluent stream;

(b) further reacting said first reforming reactor effluent stream in contact with the second of said discrete catalytic composite entities comprising a Group VIII metal, a catalytic metal modifier, and a halogen component disposed in said second of said two reforming reactors on a porous support material through which said second catalytic entity is downwardly movable via gravity-flow, said second catalytic composite entity having different catalytic properties of activity and stability than said first catalytic entity as a result of a variance in the Group VIII metal, catalytic metal modifier, or halogen content;

(c) at least periodically withdrawing a deactivated first

catalytic entity from said first reforming reactor and introducing said withdrawn deactivated first entity into a first regenerating tower through which said deactivated first entity is downwardly movable via gravity-flow;

(d) at least periodically withdrawing a deactivated second catalytic entity from said second reforming reactor and introducing said withdrawn deactivated second entity into a second regenerating tower through which said deactivated second entity is downwardly movable via gravity-flow;

(e) regenerating both said deactivated first and second catalytic entities in said respective first and second regenerating towers, in contact therein with air, halogen and steam, and drying the resulting regenerated first and second catalytic entities;

(f) withdrawing said dried, regenerated first catalytic composite entity from said first regeneration tower and at least periodically introducing said regenerated first catalytic entity into said first reforming reactor; and

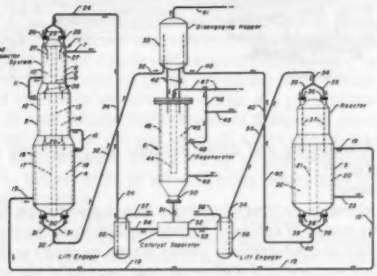
(g) withdrawing said dried, regenerated second catalytic composite entity having different catalytic properties of activity and stability than said regenerated first catalytic entity as a result of a variance in the Group VIII metal, catalytic metal modifier, or halogen content from said second regenerating tower and at least periodically introducing said regenerated second catalytic entity into said second reforming reactor.

4,167,474

MULTIPLE-STAGE CATALYTIC REFORMING WITH GRAVITY-FLOWING DISSIMILAR CATALYST PARTICLES

John G. Sikonia, La Grange, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation of Ser. No. 809,969, Jun. 27, 1977, abandoned.
This application May 2, 1978, Ser. No. 902,209
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—140 **9 Claims**



1. A process for catalytically reforming a hydrocarbonaceous charge stock which comprises contact of the said charge stock with two discrete catalytic composite entities in the sequential steps of:

(a) reacting said charge stock and hydrogen in contact with a first of said two discrete catalytic composite entities comprising a Group VIII metal, at least one metallic catalytic modifier, and a halogen component disposed in a first reactor system on a porous carrier material through which said first catalytic composite entity is downwardly movable via gravity-flow to form a first reactor system effluent stream;

(b) reacting said first reactor system effluent stream in contact with a second of said two discrete catalytic composite entities comprising a Group VIII metal, at least one metallic catalytic modifier, and a halogen component disposed in a second reactor system on a porous carrier material through which said second catalytic composite entity is downwardly movable via gravity-flow, said second catalytic composite entity having different activity and stability characteristics as a result of a variance in the concentration of said Group VIII metal, modifying metal, or halogen than said first catalytic composite entity;

(c) at least periodically withdrawing deactivated first and second discrete catalyst composites respectively from both said first and second reactor systems and commingling both said withdrawn first and second discrete catalyst entities into a common regenerating tower through which said commingled discrete catalyst entities are downwardly movable;

(d) regenerating said commingled discrete catalyst entities in said common regeneration tower in contact with air, halogen and stream, and drying the resulting commingled regenerated catalyst entities;

(e) withdrawing dried, commingled regenerated discrete catalyst entities of different catalytic activity and stability from said common regenerating tower and separating said discrete catalytic entities as a function of their difference in halogen, Group VIII metal, or modifying metal content to concentrate said first discrete catalytic composite entity and said second discrete catalytic composite entity; and

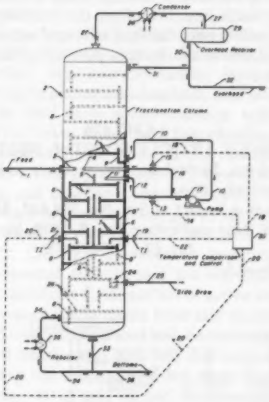
(f) at least periodically introducing said first and second regenerated catalytic composite entities into said respective first and second reactor systems.

4,167,475

FRACTIONATION PROCESS, CONTROL SYSTEM AND APPARATUS

George R. Winter, III, Mt. Prospect, and Mark C. Anderson, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 12, 1978, Ser. No. 868,967
Int. Cl.[2] B01D *3/42, 3/00*; C10G *7/00*
U.S. Cl. 208—355 **10 Claims**



1. A fractionation process which comprises the steps of:

(a) passing a feed stream comprising a mixture of at least two volatile chemicals and a relatively nonvolatile impurity into a fractionation column operated at fractionation conditions at a first intermediate point, the feed stream being passed into the column on a first lateral section of a first fractionation tray which is separated from a second lateral section of the first fractionation tray by a vertical imperforate baffle which extends upward from the surface of the tray to a height above that of any outlet downcomer associated with the first fractionation tray;

(b) removing an overhead vapor stream from the fractionation column, at least partially condensing the overhead stream to form an overhead liquid, and passing a reflux stream comprising overhead liquid into the fractionation column;

(c) adding heat to the bottom of the fractionation column through the use of a reboiler and withdrawing a sole net

bottoms stream from the bottom of said fractionation column comprising the relatively nonvolatile impurity from the fractionation column;

(d) collecting the downward flowing liquid leaving the fractionation tray immediately above the first fractionation tray and passing at least a first portion of the collected liquid onto the second lateral section of the first fractionation tray, the first portion of the collected liquid having a flow rate sufficient to provide an equal liquid loading on the first and the second lateral sections of the first fractionation tray, with the first portion of the collected liquid remaining out of contact with liquid on the first lateral section of the first fractionation tray;

(e) passing a first internal liquid stream comprising the relatively nonvolatile impurity downward from the first lateral section of the first fractionation tray to the first lateral section of a second fractionation tray located immediately below the first fractionation tray and passing a second internal liquid stream which is substantially free of the relatively nonvolatile impurity downward from the second lateral section of the first fractionation tray to the second lateral section of the second fractionation tray;

(f) repeating the operations of step (e) at subsequent lower fractionation trays to provide the parallel downward flow of the first and second internal liquid streams within the fractionation column;

(g) passing vapor of substantially uniform composition upward through the first and the second lateral sections of the second fractionation tray, admixing the vapor which has passed through the first and second lateral sections of the second fractionation tray, and passing the resultant admixed vapor through the first and second lateral sections of the first fractionation tray; and,

(h) withdrawing a liquid sidecut stream comprising at least a portion of the second internal liquid stream relatively free of nonvolatile impurities from the fractionation column at a point below both the feed inlet and second fractionation tray and above the bottom portion of said fractionation column.

4,167,476

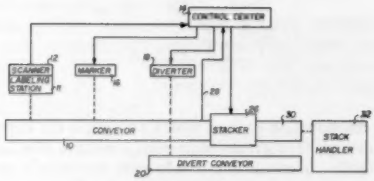
BULK ARTICLE SORTING SYSTEM

Dale H. Jackson, Bethlehem, Pa., assignor to Harris Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 794,667, May 6, 1977, abandoned. This application Jan. 5, 1978, Ser. No. 867,198

Int. Cl.[2] B07C *9/00*

U.S. Cl. 209—3.3 **5 Claims**



1. A system for applying labels to articles to be mailed, which labels are arranged in zip code groups, some groups being of less than a predetermined minimum number, and for sorting the articles to be mailed into zip code groups comprising:

first conveyor means for conveying the articles in sequence;

label applying means along the conveyor for applying labels of a zip code group in sequence to the articles;

an articles stacker associated with said conveyor for stacking articles delivered thereto;

article diverting means for diverting articles from said stacker;

means for scanning said labels, and means associated with said scanner for storing information as to the zip code grouping of a consecutive number of articles and for controlling said article stacker and diverting means to cause consecutive zip code groups, each of less than the minimum number but together greater than the minimum number to be stacked as a mixed bundle in said stacker.

4,167,477

SEPARATION OF PLASTICS BY FLOTATION

Espiridion G. Valdez, Salt Lake City, and Wayne J. Wilson, Orem, both of Utah, assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Jan. 17, 1978, Ser. No. 870,161

Int. Cl.[2] B03D *1/02*

U.S. Cl. 209—166 **2 Claims**

1. A process for separation of polystyrene plastic from polyamide plastics comprising conditioning a mixture of the plastic materials in an aqueous solution of sodium silicate at a pH of about 9 to 9.3 and subjecting the resulting mixture to froth flotation, whereby the polystyrene plastics is floated and the polyamide plastic remain in the tailings.

4,167,478

UNIVERSAL MODULAR SCREENING, CLASSIFYING, CLEANING AND SIZING MACHINE

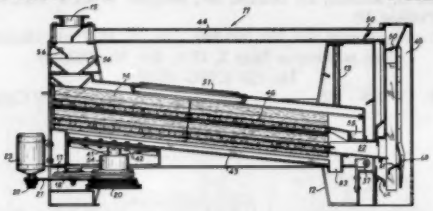
Felipe Salete, P.O. Box M-9989, Mexico 1, D.F., Mexico

Continuation of Ser. No. 636,477, Dec. 1, 1975, abandoned. This application Oct. 14, 1977, Ser. No. 842,206

Claims priority, application Mexico, Sep. 24, 1975, 160881

Int. Cl.[2] B07B *1/36*

U.S. Cl. 209—331 **3 Claims**



1. A screening and sizing machine for particulate material, comprising:

a frame;

an elongate rectangular screen box supported on the frame by means of cables to permit oscillation of the screen box;

at least one substantially planar screen mounted in the screen box and oriented with areas near one end of the screen box higher than areas near the other end of the screen box;

passage means for feeding material to be treated onto the screen at said one end of the screen box and for separately receiving at said other end of the screen box material which has passed through the screen and material which has not passed through the screen; and

a mechanism connected to the screen box for imparting elliptical movement to the screen box and comprising drive means, a support shaft attached to the underside of the screen box, a hub member mounted rotatably on the support shaft, transmission means connecting the drive means to the hub member to drive the hub member to rotate about said support shaft and including a holding member releasably secured to said hub member, and first and second counterweights clamped by said holding member to said hub member for rotation therewith, said transmission means being variable, to vary the rate of rotation of said counterweights and thereby to vary the frequency of oscillation of the screen box, and said counterweights being clamped releasably to the hub member by said holding member so that the counterweights can be moved

relative to one another about said hub member to vary the stroke of oscillation of the screen box, the frequency of oscillation and the stroke of oscillation being variable independently of one another, and said support shaft being attached to the screen box at a position near said one end iof the screen box and spaced apart from the center of gravity thereof whereby said one end of the screen box undergoes elliptical movement with the major axis of the ellipse extending transversely of the longitudinal axis of the screen box whereas said other end of the screen box undergoes substantially rectilinear oscillatory movement in a direction substantially parallel to said longitudinal axis.

4,167,479

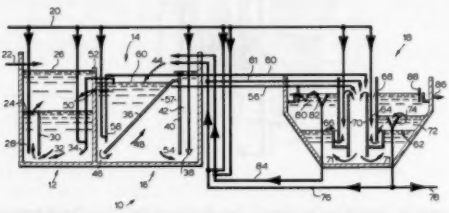
PROCESS FOR PURIFYING WASTE WATERS

Ferdinand Besik, 3243 Chokecherry Cresc., Willowdale, Ontario, Canada

Continuation-in-part of Ser. No. 730,815, Oct. 8, 1976, abandoned. This application Mar. 24, 1978, Ser. No. 889,880

Int. Cl.[2] C02C *1/04*

U.S. Cl. 210—7 **9 Claims**



1. A purification process for the removal of bio-degradable suspended and dissolved organic solids and nitrogenous compounds, and phosphates from contaminated waters by bioligical and chemical reactions carried out simultaneously in the presence of an active media which includes mixed microbial population and powdered minerals in a reactor system operating at a pH range of 6 to 8; said process comprising:

(i) adding to the system on an infrequent basis a finely divided mineral or mixture of minerals of a particle size less than 50 mesh United States Standard Screens to provide a concentration of mineral in such active media ranging from approximately 10 gm./l., up to approximately 200 gm./l., the selection of mineral being determined by the characteristics of:

(a) its being non-toxic to the micro-organisms

(b) having surfaces which attract micro-organisms, and adsorb organic compounds and phosphates to assist in and expedite the simultaneously occurring biological and chemical reactions,

(c) having limited solubility in the processed waste waters, where the metal ions released by the mineral's dissociation in such waters react with phosphate ions present in the processed waste waters to form insoluble metal phosphates at the reactor pH range of 6 to 8; and

(d) minerals having said characteristics are selected from the group consisting of Bauxite, Cerussite, Clinoptilolite, Corundum, Diaspore, Gibbsite, Halloysite, Hematite, Kyanite, Millerite, and mixtures thereof;

(ii) building up a mixed microbial population by retaining and growing in the reactor the various micro-organisms present in the waste waters on the surfaces of the mineral particles retained in the reactor system;

(iii) circulating by the use of forced air the contaminated waters and the active media which includes the mixed microbial population and powdered minerals through the reactor system which comprises at least two zones in which biological oxidation, biological nitrification, and biological denitrification reactions each occur simultaneously with the chemical reactions throughout the system and in which the concentration of free metal ions of the minerals is at the mineral's solubility levels;

(iv) such circulation involving flowing such contaminated waters downwardly through the first zone to contact such waters with the active media and

(a) maintaining the concentration of dissolved oxygen in the zone's upstream region at approximately 1 mg./l. to 2 mg./l., to support the biological oxidation of biodegradable organic solids to carbon dioxide and the biological oxidation of nitrogenous compounds to nitrites and nitrates,

(b) controlling the duration which such waters remain in said first zone as they flow therethrough so that the biological reactions reduce the concentration of dissolved oxygen in the downstream region of the first zone to below 1 mg./l. to thereby induce biological denitrification reactions;

(v) flowing at least a portion of such waters and the active media from said first zone upward through a second zone which is a sludge settling zone, and continuing the biological denitrification reactions for reducing the concentration of nitrites and nitrates wherein the second zone the concentration of dissolved oxygen is reduced to less than 0.5 mg./l.;

(vi) controlling the upward rate of flow of such waters in the second zone to provide a quiescent region which permits most of the active media to separate from such waters prior to discharge of such waters from the reactor system;

(vii) simultaneously in the first and second zones, precipitating a major portion of the phosphate ions by the reaction of said metal ions which are released by dissociation of said mineral with the phosphate ions to form insoluble precipitates at the reactor pH range of 6 to 8 to thereby lower the concentration of phosphate ions in the zones of the system; and

(viii) transferring the reactor effluent containing suspended solids from the quiescent region of said second zone to a reactor-clarifier, said reactor-clarifier having first and second vertically extending chambers, said second chamber being in fluid flow communication with said first chamber at the lower end of said first chamber, establishing a flow path of liquid downwardly through said first chamber and upwardly through said second chamber by withdrawing and aerating a portion of active media from said second chamber and returning it to the upstream end of said first chamber to maintain a dissolved oxygen concentration in the first chamber at approximately 1.0 mg./l., the upward flow in said second chamber being sufficient to develop a fluidized bed of active media where the withdrawal of active media from said second chamber is from the developed fluidized bed, completing biological and chemical reactions in such first and second chambers and separating the suspended solids from the processed waters flowing out of said second chamber and discharging such clarified waters.

4,167,480

PROCESS FOR DE-SALTING OF WATER AND APPARATUS FOR PERFORMING THIS PROCESS

Guido Mach, Rudolf Waisenhorngasse 27, A 1230 Wien-Liesing, Austria

Filed Nov. 17, 1977, Ser. No. 852,532

Claims priority, application Austria, Nov. 23, 1976, 8692/76

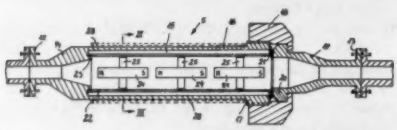
Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 H **9 Claims**

1. In a process for desalting water by passing a stream of water to be desalted to a reverse osmosis system having a high pressure chamber which receives the stream of water to be desalted and which discharges a stream of water enriched in salt and having semipermeable membrane means through which essentially desalted water passes from the high pressure chamber to a desalted water chamber, the improvement comprising passing the stream of water to be desalted, prior to its

passage through the semipermeable membrane means, through at least one magnetic field so that clogging of the pores of the semipermeable membrane means in the reverse osmosis system is reduced.

7. In apparatus for desalting water of the kind including a reverse osmosis unit having a high pressure chamber, an inlet for passing water to be desalted to the high pressure chamber, an outlet for discharging water enriched in salt from the high pressure chamber, semipermeable membrane means through



which water from the high pressure chamber passes to a desalted water chamber, and an outlet for discharging a stream of essentially desalted water from the desalted water chamber, the improvement comprising means for treating the stream of water to be desalted, before the same passes through the semipermeable membrane means, with a magnetic field so as to reduce clogging of the semipermeable membrane means, said device including means for generating a magnetic field through which the stream flows, the magnetic field having a direction which crosses the path of flow of the stream.

4,167,481

PROCESS FOR THE REMOVAL OF METALS FROM SOLUTION

Adrien E. J. Cremers, Winksele; André P. A. Maes, Kessel-Lo, and Paul G. L. Piegneur, Heverlee, all of Belgium, assignors to Leuven Research & Development VZW, Louvain, Belgium

Continuation of Ser. No. 665,522, Mar. 10, 1976, abandoned.
This application Jul. 22, 1977, Ser. No. 818,060
Claims priority, application Netherlands, Mar. 19, 1975, 7503293
Int. Cl.[2] B01D *15/04;* **C02B** *1/16;* **C02C** *5/02*
U.S. Cl. 210—36 **16 Claims**

1. A process of removing metals from an aqueous solution containing ions of at least one dissolved metal therein which is capable of forming stable cationic complexes with polyamines and which has to be removed from said solution, said process comprising the steps of:

(a) adding to said solution a polyamine selected from the group consisting of ethylenediamine, propylenediamine, triaminotriethylamine, diethylenetriamine, triethylenetetramine, tetraethylenepentamine and tetra-2-aminoethylethlenediamine in order to form stable cationic complexes with the ions of said one metal, said polyamine being added in at least equimolar amount with respect to said metal;

(b) contacting the solution of step (a) with a cation exchanger selected from the group consisting of synthetic and natural tectosilicates and phyllosilicates, in an amount of 3 to 30 grams of cation exchanger per gram of metal ion to be removed from solution, in order to adsorb said stable cationic metal-polyamine complexes from said aqueous solution onto said cation exchanger, and

(c) separating said cation exchanger from said aqueous solution after contact.

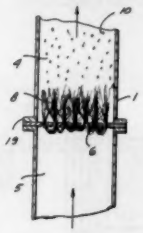
4,167,482

FILTERING METHOD AND APPARATUS

Hans Müller, Im Allmendli, 8703 Erlenbach, Switzerland

Filed Oct. 6, 1977, Ser. No. 840,007
Claims priority, application Switzerland, Oct. 11, 1976, 12913/76; Oct. 22, 1976, 13475/76; Jan. 18, 1977, 616/77
Int. Cl.[2] B01D *39/06*
U.S. Cl. 210—68 **33 Claims**

2. A filtering method for liquids and gases, comprising the step of providing a filter element which includes a perforated plate having a plurality of apertures and a plurality of mop-like pliable strands which have a length exceeding 15 mm and are supported by said perforated plate so that the major portions of each such strand can float free of said plate when a fluid medium passes through the latter; filtering a fluid medium by passing the same through said filter element in a first direction so that said major portions of said strands become entangled against said plate under the action of said fluid medium and form a mat through which said fluid medium passes and which thereby removes suspended matter from said fluid medium, whereafter the fluid medium passes through said apertures of said perforated plate; and rinsing said filter element by passing a rinsing fluid through said apertures of said perforated plate and through said filter element in a second direction which is opposite to said first direction so that said major portions of said strands become disentangled and float free of the plate, whereby said mat is broken up by said rinsing fluid which then removes adherent matter from said strands so as to regenerate said filter element.



12. A filtering apparatus for liquids and gases, comprising a housing; and a filter element in said housing, said filter element including a support formed as a perforated plate having a plurality of apertures and arranged for passing a filtering fluid through said apertures during travelling in a first direction and for passing a rinsing fluid through said apertures during travelling in a second direction which is opposite to said first direction, and a filtering medium constituted by a plurality of mop-like pliable strands which have a length exceeding 15 mm and are supported by said perforated plate so that the major portions of strands become entangled against said plate under the action of the filtering fluid when the latter travels in said first direction and form a mat through which the fluid medium passes and which thereby removes suspended matter from said filtering fluid, whereafter the fluid medium passes through said apertures of said perforated plate, and said strands become disentangled and float free of said plate under the action of a rinsing fluid when the latter travels through said apertures of said perforated plate in said second direction, whereby said mat is broken up by said rinsing fluid which then removes adherent matter from said strands so as to regenerate said filter element.

4,167,483

FLUID FILTERING DEVICE

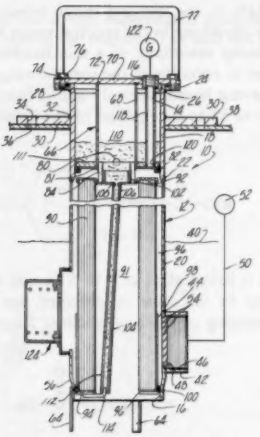
Borje O. Rosaen, 4031 Thornoaks Dr., and Dale P. Fosdick, 3000 Hunting Valley Dr., both of Ann Arbor, Mich. 48104

Filed Jul. 10, 1978, Ser. No. 922,979
Int. Cl.[2] B01D *27/10*
U.S. Cl. 210—130 **8 Claims**

1. A fluid filtering device for use with a fluid reservoir in which fluid is contained, said filtering device comprising:

an elongated tubular cylindrical housing open at each end and positioned within said reservoir so that one end of said housing is submerged within said fluid while the other open end of said housing is positioned above said fluid, said housing having a fluid inlet formed on one side and below the fluid level in the reservoir and a fluid outlet open to the reservoir;

an elongated filter assembly, said filter assembly comprising an elongated tubular extension and a tubular cylindrical filter element open at one end, means for coaxially connecting one end of the tubular extension to the other end of the filter element, said filter assembly being axially insertable into said housing so that said filter element is positioned at the lower end of said housing and spaced radially inwardly from said housing thereby forming an annular chamber in fluid communication with the housing fluid inlet;



means for fluidly sealing both axial ends of said filter element to said housing;

means for securing the other end of said extension tube to said housing;

means for siphoning fluid from the interior of the housing above said filter element upon the removal of the filter assembly from the housing; and

wherein said filter assembly can be removed from said housing without interruption of fluid flow between said fluid inlet and said fluid outlet.

4,167,484

OZONE GENERATING APPARATUS

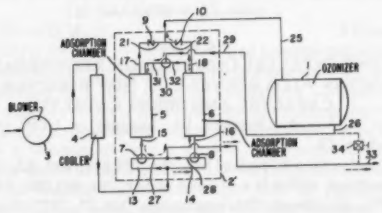
Masahiro Morikawa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 627,193, Oct. 30, 1975, abandoned. This application Jan. 10, 1977, Ser. No. 758,150

Claims priority, application Japan, Oct. 30, 1974, 49-125646

Int. Cl.[2] B01K *1/00;* **C01B** *13/10, 13/11*

U.S. Cl. 250—533 **1 Claim**



1. An ozone generating apparatus comprising:

a moisture exchanger having at least two adsorbent-filled chambers, each of said chambers having an air supply inlet and an outlet;

means for supplying a moist compressed air to said moisture exchanger; an ozonizer having an inlet and an outlet connected to said moisture exchanger for respectively receiving exclusively through said ozonizer inlet a dry gas dried in said moisture exchanger to convert the same into a dry ozone-containing gas for exclusive discharge through said ozonizer outlet;

fluid flow control means for selectively, alternatively and successively connecting said air supply means to the inlet of a selected one of said at least two adsorbent-filled chambers, while simultaneously connecting the outlet of said selected one of said chambers to said ozonizer inlet, the outlet of said ozonizer to the outlet of another of said at least two adsorbent-filled chambers and the inlet of said another of said chambers to a conduit leading from said moisture exchanger to an ozone-using part, and connecting said air supplying means to the inlet of said another of said chambers to the inlet of said ozonizer, the outlet of said ozonizer to the outlet of said selected one of said chambers and the inlet of said selected one of said chambers to said conduit leading to said ozone using part, whereby said adsorbent-filled chambers of said moisture exchanger alternatively operate to perform an adsorbing step or a purging step; and

a by-pass line between said ozonizer outlet and said conduit leading to said ozone using part and valve means therein for controlling the degree of said ozone-containing gas being formed in said ozonizer which is returned to said moisture exchanger as a purging gas and the degree of dry ozone-containing gas being formed in said ozonizer which is directly discharged to said ozone using part.

4,167,485

WATER-SOLUBLE ALKALINE EARTH METAL SALTS OF POLYMERS OF ACRYLIC ACID, AND THEIR USE AS SIZES

Wolfgang Schenk, Schwetzingen; Joachim Stedefeder, Lampertheim; Heinz Leitner, Mannheim, and Hans-Uwe Schenck, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 891,017

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714897

Int. Cl.[2] D06M *13/34*

U.S. Cl. 252—8.6 **15 Claims**

1. A process for sizing a staple fiber yarn which comprises applying to the yarn an aqueous sizing liquor which contains a water-soluble alkaline earth metal salt of a copolymer of

(a) from 90 to 30% by weight of acrylic acid and/or methacrylic acid,

(b) from 10 to 70% by weight of acrylonitrile and/or methacrylonitrile and

(c) from 0 up to 30% by weight of acrylamide and/or methacrylamide and/or an acrylic acid ester and/or a methacrylic acid ester, which salt has a viscosity of from 50 to 1,000 cp in 15% strength aqueous solution at 85° C., and drying the treated yarn.

4,167,486

LUBRICANT COMPOSITION CONTAINING A LUBRICITY AGENT

Carleton N. Rowe, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

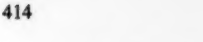
Continuation-in-part of Ser. No. 827,507, Aug. 25, 1977, abandoned. This application Jul. 20, 1978, Ser. No. 926,463

Int. Cl.[2] C10M *1/24, 3/18, 5/12, 7/20*

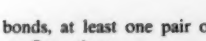
U.S. Cl. 252—56 R **15 Claims**

1. A method for reducing fuel consumption in an internal combustion engine by treating the moving surfaces thereof with a composition comprising a major amount of a lubricant containing a fuel reducing amount of an acid ester that is soluble in a predominant amount of a hydrocarbon oil, either mineral or synthetic, and that has at least two olefinic double

bonds, at least one pair of which has one of the following configurations:



and



or (2) the dimer or trimer of such acid ester whereby said acid ester, trimer or dimer is deposited on the said moving surfaces.

4,167,487

AROMATIC ACTIVATOR

Frederick W. Gray, Summit, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 367,995, Jun. 7, 1973, abandoned, which is a continuation of Ser. No. 138,373, Apr. 28, 1971, abandoned, which is a continuation-in-part of Ser. No. 828,782, May 28, 1969, Pat. No. 3,640,874. This application Jun. 3, 1974, Ser. No. 475,817

The portion of the term of this patent subsequent to Feb. 8, 1989, has been disclaimed.

Int. Cl.[2] C11D *7/54, 3/395*

U.S. Cl. 252—102 **21 Claims**

1. A method for activating an inorganic, water soluble peroxygen compound comprising dissolving said peroxygen compound in water and contacting the dissolved peroxygen compound with N-benzoyl 2-methylimidazole or N-m-chlorobenzoyl 2-methylimidazole, in an amount sufficient to provide a mol ratio of active oxygen of said peroxygen compound to activator of about 0.5:1 to 16:1.

4,167,488

HARD SURFACE CLEANING COMPOSITIONS

Justin J. Murtaugh, Guilford, Ind., assignor to The Drackett Company, Cincinnati, Ohio

Filed Aug. 31, 1977, Ser. No. 829,374

Int. Cl.[2] C11D *7/22, 7/26*

U.S. Cl. 252—160 **9 Claims**

1. A composition for hard surface cleaning consisting essentially of a minimum amount of about 5%, by weight thereof, of an alkanolamine selected from the group consisting of monoethanolamine, diethanolamine, triethanolamine, and mixtures thereof, an amount between about 0.3% and about 1.5%, by weight thereof, of a water insolubilized polysachharide having hydroxyl and carboxyl groups, the ratio range of the free acid form to the salt form of the carboxyl groups being about 0.07/1 to about 3/1, and up to about 93.5%, by weight thereof, of water.

4,167,489

LIQUID CRYSTALLINE COMPOUNDS

Maged A. Osman, Zurich, Switzerland, assignor to BBC Brown Boveri & Company, Limited, Baden, Switzerland

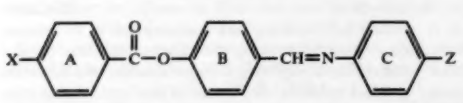
Filed Mar. 2, 1978, Ser. No. 882,742

Claims priority, application Switzerland, Mar. 8, 1977, 2861/77

Int. Cl.[2] C02F *1/13;* **C09K** *3/34;* **C07C** *121/60, 121/64*

U.S. Cl. 252—299 **4 Claims**

1. Nematic liquid crystalline compounds of the formula:



wherein X is C_1–C_8 alkyl and Z is cyano.

4,167,490

FLEXIBLE ULTRAVIOLET RADIATION TRANSMITTING FILTERS

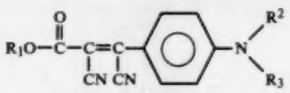
Catharine E. Looney, Wilmington, Del., assignor to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1975, Ser. No. 642,713

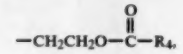
Int. Cl.[2] F21V *9/00;* **G02B** *5/22*

U.S. Cl. 252—300 **10 Claims**

1. A flexible filter capable of transmitting radiation in the spectral range between 315 and 380 nm and absorbing radiation strongly in the spectral range between 400 to 550 nm maximally absorbing in the spectral range between 440 to 500 nm, consisting essentially of a thin flexible film substantially transparent to radiation in the spectral range between 315 and 380 nm having homogeneously added thereto a dye in a concentration of 15 to 60 mg/dm^2 of the formula:



where R_1 is lower alkyl of 1 to 5 carbon atoms; R_2 and R_3, which may be the same or different, are selected from the group consisting of R_1, 2-cyanoethyl, 2-hydroxyethyl and



or from a saturated 5- or 6-membered ring; R_4 is taken from the class consisting of lower alkyl of 1 to 5 carbon atoms, aryl of 6 carbon atoms or alkaryl of 7 to 9 carbon atoms, and arakyl.

4,167,491

RADIOACTIVE WASTE DISPOSAL

Kenneth A. Gablin, Burton, and Larry J. Hansen, Tacoma, both of Wash., assignors to Nuclear Engineering Company, Jeffersontown, Ky.

Division of Ser. No. 420,008, Nov. 29, 1973, Pat. No. 4,010,108, which is a continuation of Ser. No. 220,449, Jan. 24, 1972, abandoned. This application Jun. 7, 1976, Ser. No. 693,419

The portion of the term of this patent subsequent to Mar. 1, 1994, has been disclaimed.

Int. Cl.[2] G21F *9/16*

U.S. Cl. 252—301.1 W **13 Claims**

1. An article for safe transportation and storage of radioactive waste material containing free water, comprising

a solid body of polymerized urea-formaldehyde resin having water and the radioactive components of such waste material distributed therein in controlled proportions providing a desired low hazard radiation classification of said body.

4,167,492

SPENT-CATALYST COMBUSTION REGENERATION PROCESS WITH RECYCLE OF HOT REGENERATED CATALYST AND SPENT CATALYST

Victor A. Varady, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 731,489, Oct. 12, 1976, abandoned, which is a division of Ser. No. 691,049, May 27, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 846,084

Int. Cl.[2] B01J *21/20, 29/38;* **C10G** *11/04, 11/18*

U.S. Cl. 252—417 **4 Claims**

1. In a regeneration process for oxidizing coke from spent catalyst, and oxidizing CO, resulting from the oxidation of coke, to CO_2 by

(a) passing to a coke combustor spent catalyst contaminated

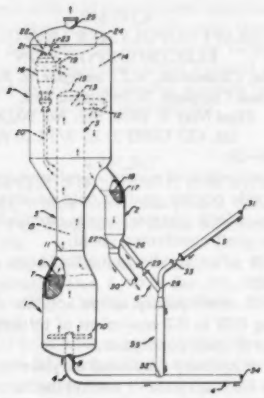
with coke, regenerated catalyst from a hereinafter specified source, and fresh regeneration gas:

(b) oxidizing coke in said combustor at oxidation conditions to produce regenerated catalyst, partially spent regeneration gas and CO;

(c) passing regenerated catalyst and partially spent regeneration gas in admixture to a CO conversion zone and therein converting, at conversion conditions, CO to CO_2 to produce spent regeneration gas and hot regenerated catalyst;

(d) separating hot regenerated catalyst from spent regeneration gas and

(e) passing one portion of hot regenerated catalyst to said combustor and passing the remainder of said hot regenerated catalyst to a hydrocarbon reaction zone, WHEREIN THE IMPROVEMENT COMPRISES passing hot regenerated catalyst and spent catalyst into a vertical, downflow heat exchange zone external to said combustor in the absence of fluidizing gas, discharging the contents of said heat exchange zone into a horizontal mixing zone, adding fresh regeneration gas to said mixing zone in an amount such that the addition of secondary air to the combustor is not required, conveying the entire amount of fresh regeneration gas so added to said mixing zone to said combustor, said mixing zone being external to said combustor, and discharging the contents of said mixing zone into said combustor.



4,167,493

HIGH EFFICIENCY CATALYST FOR HIGH BULK DENSITY POLYETHYLENE

John T. Hsieh, Irwin, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 780,134, Mar. 22, 1977, abandoned. This application Oct. 12, 1978, Ser. No. 950,780

Int. Cl.[2] C08F *4/02, 4/64*

U.S. Cl. 252—429 B **3 Claims**

1. A catalyst for the low to intermediate pressure polymerization of ethylene in the presence of an organoaluminum activator, consisting of a solid complex component obtained by heating a support of anhydrous magnesium oxide in hexane with methanol, removing the excess methanol by drying the support in a vacuum to form a support containing between 0.004 and 10 moles of methanol per mole of magnesium oxide, refluxing the treated magnesium oxide with an equimolar mixture of titanium tetrachloride and tetrabutyltitanate, removing any excess titanium compound by repeated washing of the support with an inert hydrocarbon solvent, reducing said titanium compound on said support by reacting with an organoaluminum compound in an amount such that the aluminum to titanium ratio is between 0.05 and 0.5 and said organoaluminum compound is of formula R_nAlX_{3-n}, wherein R is a hydrocarbon radical selected from branched or linear alkyl, alkenyl, cycloalkyl, aryl, alkylaryl, or arylalkyl radicals having 1 to 20 carbon atoms, X is hydrogen or halogen, and n is 1, 2 or 3, and ageing the resulting supported complex.

4,167,494

PRODUCTION OF UNSATURATED NITRILES USING CATALYSTS CONTAINING BORON, GALLIUM OR INDIUM

Robert K. Grasselli, Chagrin Falls; Dev D. Suresh, Macedonia, and Arthur F. Miller, Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Aug. 21, 1977, Ser. No. 821,035

Int. Cl.[2] B01J *21/02, 27/14, 27/02, 23/10*

U.S. Cl. 252—432 **8 Claims**

1. A catalyst having the atomic ratios described by the formula:

$$X_aA_bC_cFe_dD_eMo_{12}O_x$$

wherein

X is Ga, In or mixture thereof;

A is an alkali metal, Sr, Ba, Ra, rare earth metal, Nb, Ta, Tl, P, As, Sb, W or mixture thereof;

C is Ni, Co, Mg, Zn, Cd, Ca, Be or mixture thereof;

D is Bi, Te or mixture thereof;

and wherein

a is 0.01 to about 4;

b is 0 to about 4;

c and d are 0.01 to about 12;

e is 0.01 to about 6; and

x is the number of oxygens required to satisfy the valence requirements of the other elements present,

said catalyst being free of tin.

4,167,495

ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 734,473, Oct. 18, 1976, Pat. No. 4,097,368, which is a continuation-in-part of Ser. No. 576,924, May 12, 1975, Pat. No. 3,998,724. This application Jan. 18, 1978, Ser. No. 870,405

Int. Cl.[2] B01J *27/08, 27/10*

U.S. Cl. 252—441 **13 Claims**

1. An acidic catalytic composite comprising a halogenated porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2.5 wt. % nickel, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, nickel, and catalytically available cobalt and tin are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal and nickel are present in the elemental metallic state; wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states; and wherein substantially all of the tin is present in an oxidation state above that of the elemental metal.

4,167,496

NONACIDIC MULTIMETALLIC CATALYTIC COMPOSITE FOR USE IN HYDROCARBON DEHYDROGENATION

George J. Antos, Arlington Heights; John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 867,639, Jan. 6, 1978, Pat. No. 4,131,628, which is a division of Ser. No. 771,127, Feb. 22, 1977, Pat. No. 4,085,154, which is a continuation-in-part of Ser. No. 681,007, May 18, 1976, Pat. No. 4,013,735, which is a continuation-in-part of Ser. No. 564,386, Apr. 2, 1975, Pat. No. 3,960,711. This application Aug. 25, 1978, Ser. No. 936,994
Int. Cl.[2] B01J *21/04, 23/58, 23/64, 23/78*
U.S. Cl. 252—466 B 14 Claims

1. A nonacidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 2 wt. % rhenium, about 0.05 to about 5 wt. % cobalt, about 0.1 to about 5 wt. % alkali metal or alkaline earth metal, and about 0.01 to about 5 wt. % tin; wherein the platinum group, rhenium, catalytically available cobalt, tin and alkali or alkaline earth components are uniformly dispersed throughout the porous carrier material; wherein the average crystallite size of the tin and catalytically available cobalt components is less than 100 Angstroms in maximum dimension; wherein substantially all of the platinum group component is present in the elemental metallic state; wherein substantially all of the rhenium and catalytically available cobalt components are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon dehydrogenation conditions or in a mixture of these states; and wherein substantially all of the tin and alkali or alkaline earth components are present in an oxidation state above that of the elemental metal.

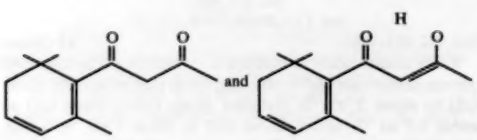
4,167,497

1-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-1,3-BUTANEDIONE AND PERFUME COMPOSITIONS

Braja D. Mookherjee, Holmdel; Richard A. Wilson, Westfield; Frederick L. Schmitt, Holmdel; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 887,630, Mar. 17, 1978. This application Nov. 17, 1978, Ser. No. 961,877
Int. Cl.[2] A61K *7/46;* C11B *9/00*
U.S. Cl. 252—522 5 Claims

1. A process for augmenting or enhancing the organoleptic properties of consumable materials selected from the group consisting of perfume compositions and colognes comprising the step of adding to said consumable material an organoleptic property modifying quantity of the composition which is an equilibrium mixture containing compounds having the structures:



4,167,498

WATER-BASED EPOXY RESIN COATING COMPOSITION

Harold G. Waddill, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Dec. 27, 1977, Ser. No. 865,050
Int. Cl.[2] C08L *63/02*
U.S. Cl. 260—18 PN 8 Claims

1. A process for the water based cure of an epoxy resin comprising a condensation product of epichlorohydrin with 2,2-bis(p-hydroxyphenyl) propane which comprises:

mixing the epoxy resin with a reactive water compatible polyamide prepared from multifunctional carboxylic acids, esters, anhydrides or mixtures and an aminopropyl derivative of a polyoxyalkylenepolyamine in an aqueous medium.

4,167,499

GRAFT COPOLYMER USEFUL IN ELECTRODEPOSITION

Isidor Hazan, Clementon, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 9, 1978, Ser. No. 902,887
Int. Cl.[2] C09D *3/52, 3/58, 5/40*
U.S. Cl. 260—21 10 Claims

1. As a composition of matter, a graft copolymer comprising a mono-epoxide portion grafted onto an acrylic-amine backbone portion, which portions consist essentially of, by weight based on the graft copolymer, about:

(a) 25–60% of an acrylic-amine backbone copolymer contributing:

14.7–35% of secondary amine acrylate or methacrylate, giving 0.08 to 0.2 equivalent of tertiary amine per 100 grams of graft copolymer,

7–17% of hydroxy-functional acrylate or methacrylate,

3–7.3% ethyl acrylate or methyl methacrylate, and

0.3–0.7% mercaptoethanol, giving primary terminal hydroxy functionality,

graft polymerized with (b) and (c):

(b) 33–60% of an epoxy-fatty acid copolymer of a condensation polymer of equimolar proportions of epichlorohydrin and bisphenol-A and reacted with fatty acid in a mole ratio of epoxy resin to fatty acid in the range of 1/1.4–1.7, and

(c) 7–15% of a glycidyl ester of a tertiary carboxylic acid containing 7 to 9 carbon atoms.

4,167,500

AQUEOUS COMPOSITIONS COMPRISING PHENOLIC RESIN AND CROSSLINKING AGENT

Peter J. Jazenski, Wattsburg, and John S. Sadowski, Erie, both of Pa., assignors to Lord Corporation, Erie, Pa.

Continuation-in-part of Ser. No. 695,705, Jun. 14, 1976, abandoned. This application Jul. 1, 1977, Ser. No. 812,289
Int. Cl.[2] C08L *61/10*
U.S. Cl. 260—29.3 15 Claims

1. A heat-reactive water-based adhesive composition comprising:

(a) at least one water-dispersible novolak phenolic resin;

(b) an effective amount of at least one methylene donor selected from the group consisting of acetal homopolymers and acetal copolymers,

said methylene donor having an average degree of polymerization greater than 200, a melting point of at least 75° C. and being substantially insoluble in water at a temperature below the melting point; and

(c) water;

the amount of water being sufficient to afford an aqueous dispersion having a total solids content, based on novolak resin, in the range from about 5 to about 75 percent.

4,167,501

PROCESS FOR PREPARING A TEXTILE-TREATING COMPOSITION AND RESIN-SILICONE COMPOSITIONS THEREFOR

Robert J. Rooks, Jamestown, N.C., assignor to Dow Corning Corporation, Midland, Mich.

Filed Apr. 13, 1978, Ser. No. 895,827
Int. Cl.[2] C08L *61/24, 83/04*
U.S. Cl. 260—29.4 R 13 Claims

1. A method for reducing the skin-over of a concentrated aqueous emulsion of a hydroxyl-endblocked polydimethylsiloxane, said method consisting of mixing at least an equal portion by weight of a concentrated aqueous solution of a durable press resin with said concentrated aqueous emulsion of a hydroxyl-endblocked polydimethylsiloxane, thereby forming a concentrated homogeneous resin-silicone blend which has increased resistance to skin-over when exposed to the atmosphere compared to the concentrated aqueous emulsion of a hydroxyl-endblocked polydimethylsiloxane.

4,167,502

CARBOXYLIC POLYMERIC THICKENERS

Sheldon N. Lewis, Willow Grove, and John J. Miller, Warminster, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 312,433, Dec. 6, 1972, Pat. No. 4,085,167. This application Dec. 5, 1977, Ser. No. 857,073
Int. Cl.[2] C08F *220/06, 222/02;* C08L *33/02*
U.S. Cl. 260—29.6 H 12 Claims

1. A method of thickening a liquid composition which comprises dissolving in the composition a solid polymer of a polymerizable mixture comprising: (A) at least about 30% by weight, of the polymer, of a monoethylenically α,β-unsaturated carboxylic acid selected from acrylic acid, methacrylic acid, ethacrylic acid, α-chloroacrylic acid, crotonic acid, itaconic acid, maleic acid, fumaric acid, citraconic acid, mesaconic acid and mixtures of same, and (B) an oligomer having a number average molecular weight of from about 400 to about 10,000, wherein the oligomer is an unhydrolyzed or partially-hydrolyzed anionically-polymerized oligomer of allyl methacrylic or a (C_3–C_7)allyloxyalkyl methacrylate; wherein the average chain length of the oligomer, n, is about 6 to about 50 mers and at least about 85% of the molecules have chain lengths of about $\sqrt{2}$n to about 2n mers and wherein the oligomer comprises about 0.1% to about 10% by weight of the mixture; in an amount effective to cause thickening.

7. A method of thickening a liquid composition which comprises dissolving in the composition a solid polymer of a polymerizable mixture comprising: (A) at least about 30% by weight, of the polymer, of a monoethylenically α,β-unsaturated carboxylic acid selected from acrylic acid, methacrylic acid, ethacrylic acid, α-chloroacrylic acid, crotonic acid, itaconic acid, maleic acid, fumaric acid, citraconic acid, mesaconic acid and mixtures of same, and (B) an oligomer having a number average molecular weight of from about 400 to about 10,000, wherein the oligomer is an unhydrolyzed or partially-hydrolyzed oligomer of allyl acrylate or a (C_3–C_7)allyloxyalkyl acrylate; wherein the average chain length of the oligomer, n, is about 6 to about 30 mers and at least about 80% by weight consists of molecules having chain lengths of about n/3 to about 3.3 n mers and wherein the oligomer comprises about 0.1% to about 10% by weight of the mixture; in an amount effective to cause thickening.

4,167,503

LIQUID COLORANT/ADDITIVE CARRIER FOR USE IN COMPOUNDING POLYMERS

Cipriano Cipriani, 9 Sunderland Dr., Morristown, N.J. 07960

Filed Nov. 28, 1977, Ser. No. 855,234
Int. Cl.[2] C08K *5/06;* B01F *3/20*
U.S. Cl. 260—33.2 R 21 Claims

1. A liquid additive concentrate composition for incorporating into molten polymers during extrusion or molding, said composition consisting essentially of:

(a) a carrier comprising an alkylated phenoxy poly(ethyleneoxy)ethanol wherein the alkyl moiety of the ethoxylated phenol is selected from the group consisting of saturated C_6 to C_{25} alkyl and dialkyl radicals and wherein the phenol moiety of the alkylated phenol is selected from the group consisting of phenols and substituted phenols and wherein the number of moles of ethylene oxide per mole of alkylated phenol is between 1 and 40 and

(b) an additive in an amount from 0.1 percent to 80 percent based on the weight of the carrier.

14. A polymer product containing the liquid additive composition of claim 1.

4,167,504

PVC PLASTICIZED WITH MONOCYCLOHEXYLBIPHENYL

Brian C. Davis, Wilmington, and Robert P. Bryer, Claymont, both of Del., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Aug. 1, 1977, Ser. No. 821,012
Int. Cl.[2] C08L *27/06;* C08J *3/18;* C08K *5/01*
U.S. Cl. 260—33.6 UA 2 Claims

1. In the process of plasticizing polyvinylchloride with an alkyl biphenyl plasticizer, the improvement which comprises using as plasticizer a composition containing from about 85% to about 88.3% of monocyclohexylbiphenyl.

4,167,505

IMPACT MODIFIED HIGH MELT FLOW POLYCARBONAMIDE

David L. Dunkelberger, Newtown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 12, 1978, Ser. No. 868,780
Int. Cl.[2] C08L *77/00*
U.S. Cl. 260—37 N 13 Claims

1. A method for preparing impact-resistant, high melt flow polycarbonamides comprising the steps of:

(a) preparing an impact modifier concentrate comprising a mixture of (i) 70–90 parts by weight of an acrylic impact modifier and (ii) 10–30 parts by weight of at least one high molecular weight aliphatic polycarbonamide having a melt flow, measured at 275° C. and 6.5 psi, of about 0.1–1.5 grams/10 minutes; and

(b) mixing 10–30 parts by weight of the impact modifier concentrate from (a) above with 70–90 parts by weight of at least one low molecular weight aliphatic polycarbonamide having a melt flow, measured at 275° C. and 6.5 psi, of about 3.5–5.0 grams/10 minutes.

11. A composition produced according to the method of claim 1.

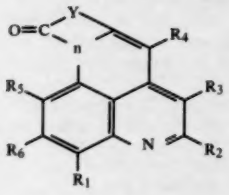
4,167,506

DIAZAPHENALENE DERIVATIVES AND RESIN CONTAINING COLOR COMPOSITIONS

Keizo Shimada, Hino; Toshiaki Harada; Masahiro Koga, both of Iwakuni; Shizuo Nagahama, Hino; Hiroyoshi Minematsu, and Hidetsugu Yoshida, both of Iwakuni, all of Japan, assignors to Teijin Limited, Japan

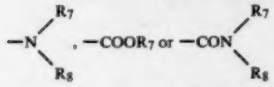
Filed Sep. 13, 1977, Ser. No. 832,914
Claims priority, application Japan, Nov. 1, 1976, 51-130426; Feb. 8, 1977, 52-12046
Int. Cl.[2] C07D *471/06*
U.S. Cl. 260—37 N 9 Claims

1. A compound of the formula

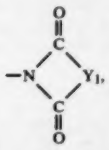


wherein

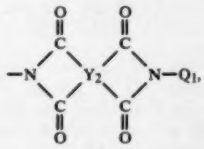
R_1 represents a hydrogen atom, a halogen atom, a hydroxyl group, a lower alkyl group, a lower alkoxy group, a lower haloalkyl group, a phenyl or naphthyl group which is unsubstituted or monosubstituted by a lower alkyl, lower alkoxy, amide or imide group, a group of the formula



a group of the formula

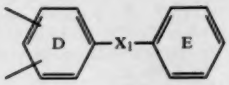


or a ground of the formula



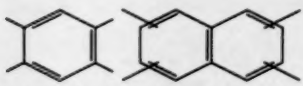
in which R_7 and R_8, independently form each other, represent a hydrogen atom, a lower alkyl group, a phenyl or naphthyl group which is unsubstituted or is monosubstituted by a lower alkyl, lower alkoxy, amide or imide group, an aryl-lower alkyl group the aryl moiety of which is a phenyl or naphthyl group and is unsubstituted or monosubstituted by a lower alkyl, lower alkoxy, amino or imide group, an acyl group of the formula R_9—CO— in which R_9 is a lower alkyl or phenyl group, or a 1,3,5-triazinyl group which is substituted by chlorophenylamino, N-methylphenylamino or the group —NH—Q_1, or R_7 and R_8 together may form a heterocyclic ring together with the nitrogen atom to which they are bonded, said heterocyclic ring being pyrrolidine, piperidine or morpholine, Y_1 represents a divalent aromatic group selected from the group consisting of:

with the two bonds being present ortho or peri to each other and

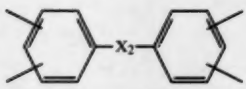


with the two bonds being present ortho to each other wherein ring A, at least one of rings B and C, and at least one of rings D and E each may have 1 to 10 substituents in total selected from the group consisting of halogen atoms, a carboxyl group, ester group of the formula —$COOR_{10}$ in which R_{10} has the same meaning as group R_7 defined above, X_1 represents a direct bond or —O—,

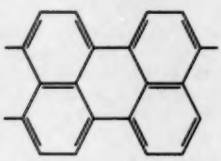
—SO_2—, —NHCO— or a lower alkylene group, Y_2 represents a tetravalent aromatic group selected from the group consisting of:



with the four bonds on the naphthalene ring forming two pairs and the two bonds in each pair being present ortho or peri to each other,



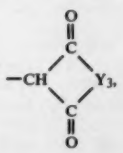
with the two bonds on each benzene ring being present ortho to each other, and



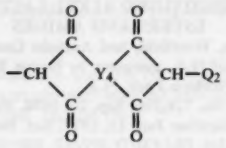
Q_1 is a monovalent group resulting from the removal of R_1 from the formula (I) above, and X_2 represents

—SO_2—, —CONH— or a lower alkylene group;

R_2 represents a hydrogen atom, a halogen atom, a lower alkyl group, a hydroxy group, a lower alkoxy group, a lower haloalkyl group, a group of the formula

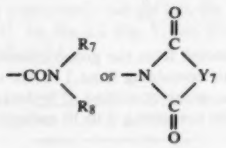


or a group of the formula



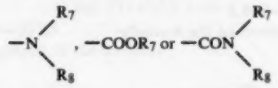
in which Y_3 is identical to or different from Y_1 and represents the same groups as does Y_1, Y_4 is identical to or different from Y_2 and represents the same groups as does Y_2, and Q_2 is a monovalent group resulting from the removal of R_2 from formula (I);

R_3, R_5 and R_6, independently from each other, represent a hydrogen atom, a halogen atom, a hydroxy group, a cyano group, a lower alkyl group, a lower alkoxy group, a lower haloalkyl group, or a group of the formula $-COOR_7$,



wherein Y_7 is identical to or different from Y_1 and represents the same groups as defined by Y_1, and R_7 and R_8 are as defined above;

R_4 represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group, a lower haloalkyl group, a phenyl or naphthyl group which is unsubstituted or monosubstituted by a lower alkyl, lower alkoxy, amide or imide group, a cyano group, a group of the formula



in which R_7 and R_8 are as defined above; and

Y represents a group of the formula $>Y_5$ in which Y_5 is identical to or different from Y_1 and represents the same groups as does Y_1, or a group of the formula $>Y_6=Q_3$ in which Y_6 is identical to or different from Y_2, and Q_3 is a divalent group resulting from the removal of Y from formula (I).

4,167,507

COMPOSITION OF A POLYPHENYLENE ETHER AND A HYDROGENATED BLOCK COPOLYMER

William R. Haaf, Voorbesville, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 826,196, Aug. 19, 1977, abandoned, which is a continuation of Ser. No. 387,588, Aug. 13, 1973, abandoned. This application Aug. 21, 1978, Ser. No. 935,099

Int. Cl.[2] **C08L** *51/00, 53/00*

U.S. Cl. 525—92 **17 Claims**

1. A normally solid thermoplastic composition comprising:

(a) from 10 to about 90% by weight of a polyphenylene ether resin or a composition comprising a polyphenylene ether resin and a styrene homopolymer or random copolymer resin, and

(b) a hydrogenated block copolymer of the A-B-A type where A is a polymerized monoalkenyl aromatic hydrocarbon block and B is a polymeric diene block which has had its unsaturation reduced to less than 10% of the original unsaturation.

4,167,508

PHLORETHYL-β-ALANYL-SECRETINE

Erich Wünsch, Tutzing, Fed. Rep. of Germany, assignor to Max-Planch-Gesellschaft zur Forderung der Wissenschaften, Gottingen, Fed. Rep. of Germany

Filed Jun. 17, 1977, Ser. No. 807,533

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1976, 2627988

Int. Cl.[2] **C07C** *103/52;* **C07G** *7/00;* **A61K** *37/100*

U.S. Cl. 260—112.5 R **3 Claims**

1. N-[3-(4-Hydroxy-3-^{125}I-phenyl)-propanoyl]-β-alanyl-secretin.

2. N-[3-(4-Hydroxy-3,5-di^{125}I-phenyl)-propanoyl]-β-alanyl-secretin.

4,167,509

WATER SOLUBLE CATIONIC AZO DYESTUFFS

Brian Parton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

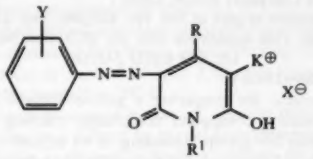
Filed Nov. 29, 1976, Ser. No. 745,777

Claims priority, application United Kingdom, Dec. 17, 1975, 51618/75

Int. Cl.[2] **C09B** *29/36, 31/14, 35/26, 43/00*

U.S. Cl. 260—156 **2 Claims**

1. Azo dyestuffs devoid of carboxylic acid and sulphonic acid groups and of the formula (I)



wherein R is methyl, R^1 is hydrogen or methyl, Y is a group $-COR^2$ wherein R^2 is an alkyl group having 7 to 16 carbon atoms, K^+ is an optionally methyl substituted pyridinium group and X^- is an anion.

4,167,510

ESTER CAPPED ALKYLENEOXY FUGITIVE TINTS AND METHOD FOR PRODUCING SAME

Ralph N. Brendle, Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 720,685, Sep. 7, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,719

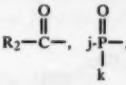
Int. Cl.[2] **C09B** *1/32, 29/08, 43/18;* **D06P** *3/00*

U.S. Cl. 260—174 **6 Claims**

1. A fugitive tint characterized by the formula

$$R\{A—(alkyleneoxy)_nR_1]_m\}_x$$

wherein RA is an organic dyestuff radical, A is N, O, S or CO_2; the alkyleneoxy contains from 2 to 4 carbon atoms, n is an integer of from 2 to 300; m is 1 when A is O, S, or CO_2 and 2 when A is N; x is an integer of from 1 to 5, and the product of n times x times m is from 2 to 300; R_1 is



sulfonates and sulfates thereof, R_2 is H, OH or alkyl containing up to 20 carbon atoms, j and k are OH, OM, or OR_3 wherein M is alkali metal, an alkaline earth metal or ammonia, and R_3 is alkyl containing up to 20 carbon atoms.

4,167,511

METHYLSILACYCLOPENTENYL-CONTAINING SILYLATING AGENTS AND METHOD THEREFOR

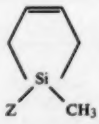
Jerome M. Klosowski, Monitor Township, Bay County, and Charles A. Romig, Midland, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 737,744, Nov. 1, 1976, Pat. No. 4,104,295. This application Feb. 21, 1978, Ser. No. 879,176

Int. Cl.[2] C07D *210/00*

U.S. Cl. 260—239.3 R **6 Claims**

1. A composition having the formula



wherein Z is a monovalent lactamo radical.

4,167,512

SYNTHESIS OF 2-KETO-1,4-DIAZACYCLOALKANES

John T. Lai, Broadview Heights, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 835,066, Sep. 21, 1977, abandoned. This application Jun. 19, 1978, Ser. No. 916,640

Int. Cl.[2] C07D *243/08*

U.S. Cl. 260—239.3 R **3 Claims**

1. A method for preparing a polysubstituted 2-keto-1,4-diazacycloalkane compound comprising reacting a diamine selected from the group consisting of an acyclic 1,2-diamine and a cyclic 1,2-diamine with a cyanohydrin selected from the group consisting of an acyclic cyanohydrin and a cyclic cyanohydrin, in the presence of (i) aqueous alkali (ii) an onium salt selected from the group consisting of the ternary salts of Group VIA elements and the quaternary salts of Group VA elements, and, (iii) a haloform selected from the group consisting of bromoform and chloroform; forming said polysubstituted 2-keto-1,4-diazacycloalkane compound; and, recovering said compound.

4,167,513

SYNTHESIS OF UNSATURATED ESTERS AND LACTONE FROM BUTADIENE AND CARBON DIOXIDE

Alfredo Musco, Segrate; Roberto Santi, and Gian P. Chiusoli, both of Novara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Sep. 5, 1978, Ser. No. 939,793

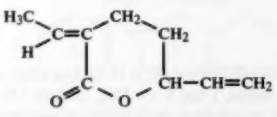
Claims priority, application Italy, Sep. 6, 1977, 27277 A/77

Int. Cl.[2] C07D *309/30*; C07C *69/61*

U.S. Cl. 260—343.5 **2 Claims**

1. As products new in themselves, the isomeric octadienyl esters of 2-ethylidenehepta-3,5-dienoic and 2-vinyl-hepta-3,5-dienoic acids of formula $C_8H_{11}COOC_8H_{13}$.

2. As a product new in itself, the unsaturated δ-lactone of formula (II):



(II)

or 2-ethylidene-hepta-6-ene-5-olide.

4,167,514

HETEROSUBSTITUTED ALKYL LACTONE ACIDS, ESTERS AND AMIDES

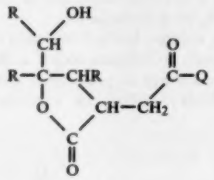
Stanley J. Brois, Westfield, and Antonio Gutierrez, Hamilton Square, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 726,206, Sep. 24, 1976, Pat. No. 4,062,786. This application Jun. 13, 1977, Ser. No. 806,326

Int. Cl.[2] C07D *307/32, 309/30*

U.S. Cl. 260—343.5 **9 Claims**

1. A hydroxy substituted alkyl lactone acid, ester or amide material represented by the formula:



wherein R is selected from the group consisting of hydrogen and alkyl radicals containing from 1 to 400 carbons and Q is selected from the group consisting of hydroxy, C_1–C_{10} alkoxy and dialkyl amido containing 2 to 10 carbons.

4,167,515

ANOREXIC CHROMANS

Derek V. Gardner, Bishops Stortford, England, assignor to Beecham Group Limited, Great Britain

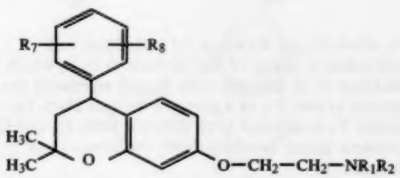
Division of Ser. No. 652,041, Jan. 26, 1976, Pat. No. 4,080,335, which is a continuation-in-part of Ser. No. 599,694, Jul. 28, 1975, abandoned. This application Nov. 9, 1977, Ser. No. 849,993

Claims priority, application United Kingdom, Jul. 30, 1974, 33549/74

Int. Cl.[2] C07D *311/02*

U.S. Cl. 260—345.2 **8 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof wherein R_1 is hydrogen or alkyl of 1–6 carbon atoms; R_2 is hydrogen, methyl or ethyl; R_7 is hydrogen, fluoro, chloro, trifluoromethyl or methoxyl; and R_8 is hydrogen.

4,167,516

PREPARATION OF DICARBOXYLIC ANHYDRIDES

Ralph O. Kerr, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Division of Ser. No. 767,499, Feb. 10, 1977, Pat. No. 4,105,586. This application Feb. 27, 1978, Ser. No. 881,196

The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.

Int. Cl.[2] C07D *307/60*

U.S. Cl. 260—346.75 **9 Claims**

1. In a process for the partial oxidation of C_4 to C_{10} hydrocarbons to prepare the corresponding dicarboxylic anhydrides comprising contacting a feed containing to C_4 to C_{10} alkane hydrocarbons in vapor phase at elevated temperatures, with oxygen and a catalyst composition wherein the improvement

comprises a catalyst composition consisting of vanadium, phosphorus and oxygen and a modifying component consisting of

I

(a) the elements Nb, Cu, Mo, Ni, Co and Cr, and

(b) one or more elements selected from the group consisting of Y, Sm, Tb. and Eu.

II

(a) the elements Nb, Cu, Mo, Ni, Co and Cr,

(b) one or more of the elements selected from the group consisting of Ce, Nd, Ba, Hf, U, Ru, Re, Li or Mg, and

(c) one or more of the elements selected from the group consisting of Y, Sm, Tb and Eu,

wherein the atomic ratio of vanadium:phosphorus:Nb:Cu:-Mo:Ni: Co:Ce:Nd:Cr:Ba:Hf:U:Ru:Re:Li:Mg:Y:Sm:Tb:Eu is 1:0.90 to 1.3:0.001 to 0.125:0.022 to 0.201:0.0025 to 0.040:0.0022 to 0.045:0.004 to 0.066:0.0054 to 0.2:0.0022 to 0.20:0.0003 to 0.003:0.0023 to 0.0585:0.0023 to 0.0409:0.0033 to 0.0993:0.0002 to 0.02015:0.0002 to 0.0074:0.0072 to 0.179:0.0088 to 0.222:0.0001 to 0.02:0.0001 to 0.02:0.0001 to 0.02:0.0001 to 0.02, respectively, the total atomic ratio of Nb, Cu, Mo, Ni, Co, Ce, Nd, Cr, Ba, Hf, U, Ru, Re, Li, Mg, Y, Sm, Tb and Eu being in the range of 0.033 to 0.4.

4,167,517

GONA-4,9(10)-DIENES AND PROCESS OF PRODUCING THE SAME

Kurt Ponsold; Michael Hubner, and Michael Oettel, all of Jena, German Democratic Rep., assignors to VEB Jenapharm, Jena, German Democratic Rep.

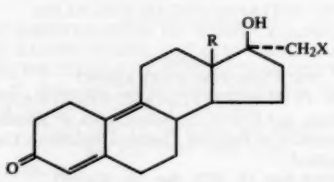
Continuation-in-part of Ser. No. 806,471, Jun. 14, 1977, abandoned. This application Jul. 18, 1977, Ser. No. 816,871

Claims priority, application German Democratic Rep., Jun. 14, 1976, 193348

Int. Cl.[2] **C07J** *1/00*

U.S. Cl. 260—397.4 **3 Claims**

1. A compound of the formula



I

wherein R is methyl and X is N_3 or CN.

4,167,518

NON-ALLERGENIC LANOLIN COMPOSITIONS

Makoto Yamanaka, Koganei; Tsuruo Mikata, Kashiwa; Satoshi Takano, Funabashi; Kikuhiko Okamoto, Koshigaya, and Fumio Saito, Tokyo, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1976, Ser. No. 717,403

Claims priority, application Japan, Oct. 9, 1975, 50/122331

Int. Cl.[2] **A61K** *7/48, 47/00*

U.S. Cl. 260—397.25 **4 Claims**

1. A non-allergenic lanolin, characterized by not containing any substances having a Rf value of less than 0.38 when subjected to a thin layer chromatography test wherein the adsorbent is magnesium silicate having a thickness of 0.25 mm and the solvent is chloroform.

4,167,519

OLEIN-STEARIN SEPARATION

Ong S. Hock, and Chuah C. Cheng, both of Minden, Malaysia, assignors to University of Science of Malaysia, Malaysia

Continuation-in-part of Ser. No. 655,974, Feb. 6, 1976, abandoned. This application Sep. 23, 1977, Ser. No. 836,240

Claims priority, application United Kingdom, Mar. 7, 1975, 9698/75

Int. Cl.[2] **C09F** *5/10;* **C11B** *3/00*

U.S. Cl. 260—428.5 **8 Claims**

1. A process for recovering olein and stearin fractions from an oil containing olein and stearin fractions, which process comprises providing a fluid comprising:

(a) the oil, with

(b) a liquid single-phase mixture having a density intermediate those of the olein and stearin fractions to be separated and consisting, essentially of

(i) at least 30% by volume of water or at least 20% by volume of at least one aliphatic alcohol containing two or three hydroxyl groups per molecule and having a molecular weight below 1000,

(ii) not more than 80% by volume of at least one polar organic liquid selected from the group consisting of monohydric alihphatic alcohols, aliphatic aldehydes, and ketones having from 1 to 5 carbon atoms,

at a temperature below the melting point of the stearin fraction to be separated and at which the liquid mixture is substantially insoluble in the oil, the proportion of oil to liquid mixture being from 10:1 to 1:10 by volume,

separating the oil into olein and stearin fractions by physical separation into layers and recovering the fractions.

2. A process as claimed in claim **1** wherein the temperature of the fluid is from 0° to 35° C.

3. A process as claimed in claim **1**, wherein the oil is a palm oil which has been refined by partial crystallisation.

5. A process as claimed in claim **1** wherein the case where separation is effected by allowing the fluid to stand the volume ratio of liquid mixture to oil varies from 10:1 to 1:5.

6. A process as claimed in claim **1** wherein separation of the fractions is effected by centrifuging at at least 900 g.

4,167,520

PROCESS FOR PREPARING ORGANOTIN TRIHALIDES

Joseph W. Burley, Wallasey, England, assignor to Akzo N.V., Arnhem, Netherlands

Continuation of Ser. No. 760,329, Jan. 18, 1977, abandoned. This application Apr. 28, 1978, Ser. No. 901,224

Claims priority, application United Kingdom, Jan. 23, 1976, 2658/76

Int. Cl.[2] **C07F** *7/22*

U.S. Cl. 260—429.7 **2 Claims**

1. A process for the preparation of organotin trihalides which comprises reacting tin tetrahalide with an organotin dihalide of the general formula R_2SnHal_2 according to the reaction:

$$R_2SnHal_2 + SnHal_4 \rightarrow 2RSnHal_3$$

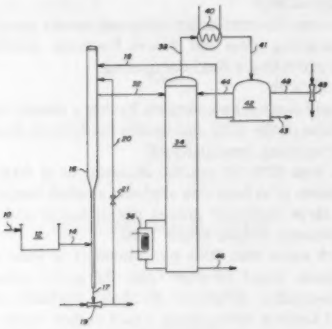
wherein Hal denotes a halogen atom and R represents a monovalent residue derived from an olefinic compound selected from the group consisting of acrylic acid, acrylate esters, acryloyl halides and vinyl alkyl ketones.

4,167,521

RECOVERY OF NITRATED COMPOUNDS USING SOLVENT EXTRACTION AND DISTILLATION

Frank C. Fowler, Kansas City, Mo., and Don H. Smith, Dallas, Tex., assignors to Atlas Powder Company, Dallas, Tex.

Filed Apr. 24, 1978, Ser. No. 899,261
Int. Cl.[2] C07C *77/02;* B01D *3/10*
U.S. Cl. 260—467 12 Claims



1. A process for separating nitroglycerin from an aqueous solution thereof comprising:

contacting said aqueous solution of nitroglycerin with an effective amount of ethylene glycol dinitrate to thereby extract said nitroglycerin out of said aqueous solution and into said ethylene glycol dinitrate and thereafter separating the resulting ethylene glycol dinitrate phase from the resulting aqueous solution.

4,167,522

GUANIDINE PANTOATE

Claude Gillonnier, Neris-les-Bains, and René Moisson, Montlucon, both of France, assignors to A.E.C. Societe de Chimie Organique et Biologique, Commentry, France

Filed Sep. 5, 1978, Ser. No. 939,681
Claims priority, application France, Sep. 5, 1977, 77 26823
Int. Cl.[2] C07C *129/00*
U.S. Cl. 260—501.14 2 Claims

1. Guanidine pantoate in its D and L forms, or mixtures thereof.

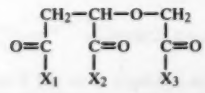
4,167,523

CARBOXYMETHYLOXYSUCCINIC ANHYDRIDES, HALIDES AND DERIVATIVES THEREOF

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 797,226, May 16, 1977, Pat. No. 4,093,634.
This application Apr. 4, 1978, Ser. No. 893,227
Int. Cl.[2] C07C *153/00*
U.S. Cl. 260—502.6 1 Claim

1. Thiolcarboxymethoxysuccinic acids of the formulae:



wherein X_1, X_2 and X_3 is OH or SH and at least one of X_1, X_2 and X_3 is SH.

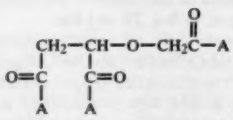
4,167,524

CARBOXYMETHYLOXYSUCCINIC ANHYDRIDES, HALIDES AND DERIVATIVES THEREOF

Vincent Lamberti, Upper Saddle River, and Gutierraz Eddie N., Fort Lee, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 797,226, May 16, 1977, Pat. No. 4,093,634.
This application Apr. 4, 1978, Ser. No. 893,232
Int. Cl.[2] C07C *55/22*
U.S. Cl. 260—544 Y 2 Claims

1. Carboxymethyloxysuccinic trihalides of the formula:



wherein A is Cl, Br or I.

4,167,525

PROCESS FOR PREPARATION OF AROMATIC ACYL CHLORIDE

Yushin Kataoka; Shojiro Itoh, and Masahiro Niwano, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 10, 1978, Ser. No. 923,354
Claims priority, application Japan, Jul. 20, 1977, 52-87807
Int. Cl.[2] B01D *3/34;* C07C *63/00*
U.S. Cl. 260—544 D 8 Claims

1. A process for preparing an aromatic acyl chloride, comprising reacting an aromatic carboxylic acid, phosphorus trichloride and chlorine, treating the reaction mixture comprising by-produced phosphorus pentachloride with at least one treating agent selected from the group consisting of water and phosphorus compounds to convert the phosphorus pentachloride into phosphorus oxychloride, and then subjecting the resulting reaction mixture to distillation to obtain phosphorus oxychloride and successively the desired aromatic acyl chloride.

4,167,526

PROCESS FOR PREPARING N,N,N',N'-TETRAPHENYLDIAMINOMETHANE

Alan C. Farthing, and Eric S. Nicholson, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 18, 1974, Ser. No. 524,947
Claims priority, application United Kingdom, Nov. 29, 1973, 55419/73
Int. Cl.[2] C07C *91/16*
U.S. Cl. 260—570.5 P 8 Claims

1. A process for the manufacture of N,N,N',N'-tetraphenyldiaminomethane which comprises reacting 2 molar proportions of diphenylamine with from 0.8 to 1.3 molar proportions of formaldehyde at a temperature below the melting point of the reaction mixture.

4,167,527

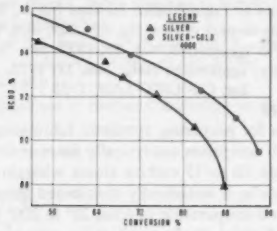
METHANOL OXIDATION/DEHYDROGENATION OVER SILVER-GOLD ALLOY

Norman A. Nielsen, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 23, 1978, Ser. No. 871,594
Int. Cl.[2] C07C *45/16*
U.S. Cl. 260—603 C 12 Claims

1. In a process for selective oxidation/dehydrogenation of methanol to formaldehyde using a metal catalyst at a tempera-

ture of from 550 to 700° C. in a single or two-stage reaction system the improvement wherein the metal catalyst is a silver-



gold alloy containing 5 to 80 atomic % gold in the single stage or in both stages of the two stage system.

4,167,528
PROCESS FOR THE PRODUCTION OF TETRABROMOETHYLENE
Anthony K. Uriarte, and James H. Vaughan, both of Pensacola, Fla., assignors to Monsanto Company, St. Louis, Mo.
Filed Jun. 7, 1978, Ser. No. 913,426
Int. Cl.[2] C07C *21/00*
U.S. Cl. 260—654 A **10 Claims**

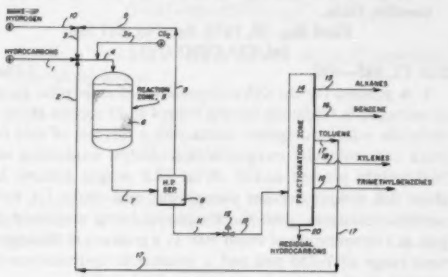
1. Process for the oxybromination of butane in the production of tetrabromoethylene comprising reacting butane with free oxygen and bromine, at mole ratios of oxygen and bromine to butane of 0.1–2.5 and 0.1–4 respectively, all in gaseous phase, in the presence of a cupric bromide catalyst on a zeolite support having a selectively adsorptive structure corresponding generally to the adsorptivity of the natural zeolite faujasite, having a nominal pore size of about 10 angstroms, under conditions of pressure and temperature corresponding to temperatures at atmospheric pressure between 250°and 300° C. so as to foster formation of the tetrabromoethylene in a reaction medium also comprising oxygen, bromine unreacted butane and water.

4,167,529
SELECTIVE HYDROGENATION OF CYCLOPENTADIENE TO FORM CYCLOPENTENE USING RANEY NICKEL CATALYST AND AMMONIUM HYDROXIDE IN THE REACTION MIXTURE
Lawson G. Wideman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Nov. 11, 1977, Ser. No. 850,577
Int. Cl.[2] C07C *5/06, 5/16*
U.S. Cl. 585—274 **3 Claims**

1. The process for the preparation of cyclopentene which comprises selectively hydrogenating cyclopentadiene in the liquid phase by contacting cyclopentadiene with hydrogen in the presence of a hydrogenation catalyst comprising a highly dispersed form of nickel selected from the group consisting of Ranel nickel or modified Ranel nickel in which ammonium hydroxide is employed in the reaction mixture in the volume ratio of ammonium hydroxide to cyclopentadiene of from 1/1 to 4/1.

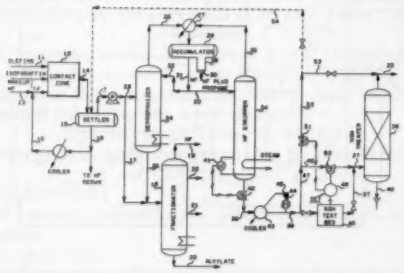
4,167,530
PROCESS FOR THE DISPROPORTIONATION OF PETROLEUM HYDROCARBONS
Ralph J. Bertolacini, Chesterton, Ind.; Dae K. Kim, Naperville, Ill., and Gerald M. Lehmann, Gary, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.
Filed Nov. 8, 1977, Ser. No. 849,605
Int. Cl.[2] C07C *3/62*
U.S. Cl. 585—475 **12 Claims**

1. A process for the disproportionation of petroleum alkyl aromatic hydrocarbons which comprises contacting in a reaction zone said petroleum hydrocarbon under suitable disproportionation conditions with a catalytic composition consisting essentially of a tungsten/molybdenum component deposited



upon an acidic cracking component consisting essentially of a mordenite large pore crystalline aluminosilicate material and a refractory inorganic oxide.

4,167,531
PURIFICATION OF HYDROCARBONS
Mack F. Potts, Bartlesville, Okla., assignor to Phillips Petroleum Co., Bartlesville, Okla.
Filed Aug. 12, 1977, Ser. No. 824,125
Int. Cl.[2] C07C *9/00*
U.S. Cl. 585—854 **7 Claims**



1. In a process for removing HF acid from a hydrocarbon stream containing same by contacting with solid KOH in a treating zone, the steps of preventing excessive temperature increases above a preselected maximum allowable temperature and subsequent explosion in said treating zone when unexpected excess HF is present in said stream charged to said treating zone comprising:

passing a portion of said hydrocarbon stream through a small test bed of KOH,

measuring the temperature in said test bed and producing a signal representative thereof, and

controlling the flow of the remainder of said hydrocarbon stream in response to said signal by allowing the flow to pass to said treating zone when the measured temperature is below said preselected maximum allowable temperature, and stopping said flow of said hydrocarbon stream to said treating zone when excess HF is present in said hydrocarbon stream and the measured temperature of said test bed reaches and/or exceeds said preselected maximum allowable temperature, thereby diverting said hydrocarbon stream from being introduced into said treating zone.

4,167,532

DEHYDROGENATION OF ORGANIC COMPOUNDS

Darrel W. Walker; Robert J. Hogan, and Floyd Farha, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Filed Sep. 29, 1975, Ser. No. 617,754
Int. Cl.[2] C07C *11/12*
U.S. Cl. 585—622 3 Claims

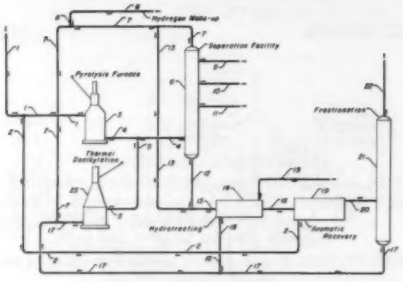
1. A process for the dehydrogenation of an acyclic paraffin or monoolefin feedstock having from 4 to 12 carbon atoms per molecule which comprises contacting a mixture of said feedstock and molecular oxygen with a catalyst containing about 56.0 weight percent nickel, about 18.8 weight percent lead, about 1.8 weight percent phosphorus and about 1.4 weight percent potassium, with the remainder being combined oxygen, at a temperature of about 900° F. a pressure in the approximate range of 7–250 psia and a volumetric hydrocarbon:oxygen ratio in the approximate range of 1:1 to 1:4.

4,167,533

CO-PRODUCTION OF ETHYLENE AND BENZENE

Robert F. Raymond, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 7, 1978, Ser. No. 894,264
Int. Cl.[2] C07C *3/30*
U.S. Cl. 585—251 10 Claims



1. A process for the co-production of ethylene and benzene, from a hydrocarbonaceous charge stock, which process comprises the sequential steps of:

(a) thermally cracking said charge stock at conditions selected to convert paraffinic hydrocarbons into lower-boiling, normally vaporous hydrocarbons;

(b) separating the resulting thermally-cracked product effluent, in a first separation zone, to (i) recover a hydrogen-rich vaporous phase, (ii) recover ethylene and, (iii) provide a normally liquid stream containing aromatic hydrocarbons;

(c) further separating said normally liquid stream, in a second separation zone, to (i) concentrate aromatic hydrocarbons, and, (ii) recover unconverted non-aromatic hydrocarbons;

(d) separating said aromatic hydrocarbons, in a third separation zone, to (i) recover benzene and, (ii) provide an alkylaromatic hydrocarbon stream;

(e) reacting said alkylaromatic hydrocarbon stream, in admixture with at least a portion of said hydrogen-rich vaporous phase, in a dealkylation reaction zone at conditions selected to convert said stream into benzene; and,

(f) introducing the resulting dealkylation zone effluent into said first separation zone.

4,167,534

PROCESS FOR THE PREPARATION OF SYNTHETIC LUBRICATING OILS

Vincenzo Petrillo, and Andrea Peditto, both of Robassomero, Italy, assignors to Liquichimica Italiana S.p.A., Italy

Continuation-in-part of Ser. No. 694,229, Jun. 9, 1976, abandoned. This application Nov. 16, 1977, Ser. No. 852,368
Claims priority, application Italy, Jun. 11, 1975, 24263 A/75
Int. Cl.[2] C07C *5/04, 3/18*
U.S. Cl. 585—18 3 Claims

1. A process for preparing synthetic lubricating oils from n-olefins, which comprises catalytically autocondensing n-olefins having from 10 to 15 carbon atoms wherein the double bond of said olefin is statistically distributed throughout the carbon chain at a temperature of from 20° to 200° C., utilizing 0.1–10% of a Friedel Crafts catalyst by weight of n-olefin, separating a light fraction and a bottom fraction by distillation and stabilizing said bottom fraction by catalytically hydrogenating any residual double- or triple-bonded hydrocarbons in said bottom fraction, said bottom fraction comprising the desired lubricating oil.

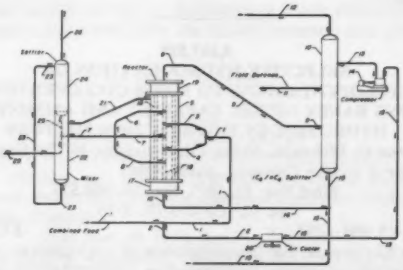
3. Synthetic lubricating oil, when prepared by the process according to claim 1.

4,167,535

ISOPARAFFIN-OLEFIN ALKYLATION UTILIZING LIQUEFIED NORMAL PARAFFIN CONCENTRATE IN THE REACTION VESSEL

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 24, 1978, Ser. No. 899,601
Int. Cl.[2] C07C *3/54*
U.S. Cl. 585—717 10 Claims



1. A process for the acid-catalyzed alkylation of an isoparaffin with an olefinic feed stream which comprises the steps of:

(a) separating an isoparaffin and a normal paraffin mixture at separation conditions of temperature and pressure to provide (i) an isoparaffin concentrate and, (ii) a normal paraffin concentrate;

(b) increasing said pressure of said isoparaffin concentrate and reducing said temperature of said isoparaffin concentrate separated from step (a);

(c) reacting said isoparaffin from step (b) with said olefinic feed stream in admixture with an acid-acting catalyst, in a reaction vessel and at alkylation conditions selected to produce a normally liquid alkylate product;

(d) introducing a liquefied portion of said normal paraffin concentrate into said reaction vessel and therein vaporizing said normal paraffin via heat exchange means in said vessel in contact with the reaction mixture of step (c), and

(e) withdrawing an alkylate product from step (c).

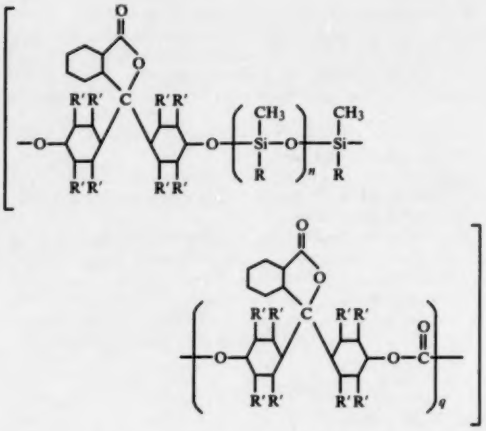
4,167,536

ORGANOPOLYSILOXANE-PHENOLPHTHALEIN-POLYCARBONATE COPOLYMERS

Arnold Factor, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 21, 1978, Ser. No. 926,842
Int. Cl.[2] C08L *43/04, 83/00*
U.S. Cl. 525—450 6 Claims

1. A composition of matter comprising units of the general formula



where R is independently selected from the lower alkyl radicals of from 1 to 3 carbon atoms and the phenyl radical, R′ is independently selected from H, an alkyl radical having from 1 to 4 carbon atoms inclusive, chlorine, bromine, iodine and nitro, and n and q independently are whole numbers equal to at least 1.

4,167,537

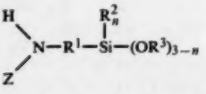
SURFACE-TREATING COATING COMPOSITION FOR PLASTIC ARTICLES

Susumu Taniyama, Toyonaka; Hiromitsu Takanohashi, Takarazuka, and Shoichi Inoue, Itami, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Japan

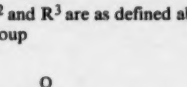
Filed Jan. 16, 1978, Ser. No. 869,863
Claims priority, application Japan, Jan. 20, 1977, 52-4394
Int. Cl.[2] C08L *61/28, 83/06*
U.S. Cl. 525—443 6 Claims

1. A surface-coating composition for plastic articles, which comprises as a film-forming agent a mixture of

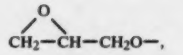
(A) a mixture of the reaction of an aminoalkylalkoxy silane of the general formula



wherein R^1 represents a divalent hydrocarbon group containing 1 to 4 carbon atoms, R^2 and R^3 represent a monovalent hydrocarbon group containing 1 to 4 carbon atoms, Z represents a hydrogen atom or an aminoalkyl group, and n is 0 or 1, with an epoxyalkylakoxy silane of the general formula

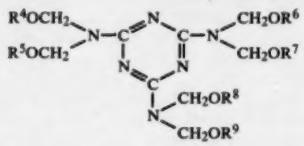


wherein R^1, R^2 and R^3 are as defined above, Q represents a glycidoxy group



or an epoxycyclohexyl group, and m is 0 or 1, and

(B) a mixture of an alkyl-modified methylol melamine of the general formula



(III)

wherein R^4, R^5, R^6, R^7, R_8 and R^9 represent a hydrogen atom or a monovalent hydrocarbon group with 1 to 4 carbon atoms, and an alkyd resin; the amount of component (A) being 45 to 80% by weight, and the amount of component (B) being 20 to 55% by weight, both based on the total amount of components (A) and (B).

4,167,538

RESINOUS COMPOSITION FOR SURFACE-TREATING REINFORCING FIBERS AND SURFACE-TREATING PROCESS

Itsuki Taniguchi; Ryuichi Itoh, both of Kyoto; Toshihiro Iwatsuki, Nagaokakyo, and Shigehiro Ohuchi, Iyo, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan and Sanyo Chemical Industries, Inc., Kyoto, Japan

Filed Oct. 18, 1977, Ser. No. 843,336
Claims priority, application Japan, Oct. 19, 1976, 51/124487
Int. Cl.[2] C08L *63/00*
U.S. Cl. 525—438 22 Claims

1. A resinous composition for surface-treating fibers, which comprises:

(A) an epoxy resin,

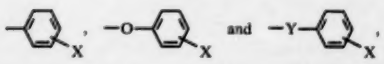
(B) a condensation product of an acid component comprising an unsaturated dibasic acid and a hydroxyl component comprising an oxyalkylated bisphenol having 1 to 100 oxyalkylene units, and;

(C) an oxyalkylene derivative of a phenol, which derivative has 1 to 120 oxyalkylene units, said phenol being at least one compound selected from the group consisting of:

(i) a compound having the formula (2):

(2)

wherein p is an integer of 1 to 3, Ar is benzene nucleus or naphthalene nucleus, which nucleus may be substituted with at least one member selected from the group consisting of an alkyl group having 1 to 15 carbon atoms,



wherein X is H, OH or alkyl group having 1 to 15 carbon atoms, and Y is an alkylene group having 1 to 5 carbon atoms or a fluoro-substituted alkylene group having 1 to 5 carbon atoms; and

(ii) a reaction product of a compound having the formula (2)

with at least one compound selected from the group consisting of styrene and a substituted styrene,

the ratio by weight of (A) to (B) being 10 to 90:90 to 10, and the amount of (C) being 5 to 30% by weight based on the total weight of (A) and (B).

4,167,539

STYRENE-GRAFTED POLYANHYDRIDE COPOLYMER

William J. Heilman, Houston, Tex.; Frank C. Peterson, Joplin, Mo.; Mical C. Renz, and Leslie P. Theard, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 590,460, Jun. 26, 1975, Pat. No. 4,017,453, which is a continuation of Ser. No. 501,634, Aug. 29, 1974, abandoned. This application Mar. 8, 1977, Ser. No. 775,432

Int. Cl.[2] **C08L** *63/00*

U.S. Cl. 525—117 **12 Claims**

1. A method of grafting styrene onto a polyanhydride copolymer having a linear backbone chain which comprises

(1) preparing a solution consisting of a linear copolymer of styrene and maleic anhydride having a mol ratio of styrene to maleic anhydride of between about 1:1 and about 5:1 or a copolymer of a 1-alkene and maleic anhydride having a mol ratio of about 1:1 and a peroxide free radical initiator in a solvent selected from an oxygenated aliphatic hydrocarbon in which the oxygen atom is only bonded to carbon, said copolymer having between about three and about 500 repeating units,

(2) heating said solution to a temperature between about 50° C. and about 150° C. sufficient to activate said free radical initiator, and

(3) incrementally adding styrene to said solution at said temperature until from about 0.5 to about 10 mols of styrene have been added per anhydride equivalent in said polyanhydride copolymer whereby styrene side chains are randomly grafted to the linear backbone chain of said polyanhydride copolymer.

12. A method of grafting styrene onto a polyanhydride copolymer having a linear backbone chain which comprises

(1) forming a solution consisting essentially of (a) styrene monomer, (b) an anhydride component consisting of maleic anhydride monomer and a polyanhydride copolymer having a linear backbone chain, the mol ratio of styrene monomer to maleic anhydride monomer being between about 1.5:1 and about 8:1 and the ratio of anhydride equivalents in the maleic anhydride monomer to the total anhydride equivalents in the anhydride component being between about 0.2:1 to about 1:1,

said polyanhydride comprising the copolymer having between two and about 500 repeating units and prepared from one to 10 mols of styrene per mol of maleic anhydride or prepared from equimolar amounts of maleic anhydride and one or more two to 20 carbon 1-alkenes or halogen-substituted 1-alkenes,

(c) a free radical initiator, (d) an epoxide having a 1,2-epoxy equivalent value greater than one, a saturated monoepoxy compound having from three to 20 carbon atoms, or a mixture thereof and (e) an anhydride accelerator, and

(2) copolymerizing said styrene monomer and said anhydride component by free radical means at a temperature up to about 150° C. whereby a polyanhydride polymer is prepared having relatively short styrene side chains randomly grafted to the linear backbone chain of said polyanhydride copolymer without substantial reaction of the anhydride groups with the epoxide groups present in the mixture.

4,167,540

METHOD OF IMPROVING THE TACKINESS OF RUBBER COMPOSITIONS WITH MODIFIED ALKYLPHENOL NOVOLAK

Arnold Giller, Tanusstein, and Wolfgang Hesse, Breckenheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 2, 1976, Ser. No. 710,548

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1975, 2537656

Int. Cl.[2] **C08L** *9/00, 61/00*

U.S. Cl. 525—135 **5 Claims**

1. A method of improving the tackiness of a styrene-butadiene copolymer rubber composition which comprises admixing therewith from 0.3 to 15% by weight, referred to the rubber, of a modified alkylphenol novolak prepared from

(A) a phenol component selected from the group consisting of

(i) a monoalkylphenol having from 3 to 18 carbon atoms in the alkyl group, and

(ii) a mixture of (i) with up to 30 mol% of a dialkylphenol having a total of from 6 to 24 carbon atoms in the alkyl groups with

(B) a phenolic substance selected from the group consisting of phenol, m-cresol, 3,5-dimethylphenol, pyrocatechol, hydroquinone, resorcinol, diphenylolpropane, diphenylolmethane and low molecular weight novolaks, prepared from the mentioned phenols and formaldehyde which is at least trifunctional with respect to formaldehyde and

(C) formaldehyde

wherein the molar ratio of one of components (i) and (ii): (B) is from 70:30 to 99:1.

4,167,541

CONTINUOUS CARRIERLESS DYEABLE POLYESTERS

William Alexander, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed May 12, 1977, Ser. No. 796,267

Int. Cl.[2] **C08L** *67/02;* **D01F** *6/84, 6/88, 6/92*

U.S. Cl. 525—444 **11 Claims**

1. A continuous carrierless dyeable polyester fiber, said polyester being a melt blend system comprising an intimate blend of (a) not less than 78% by weight of poly(ethylene terephthalate) copolymerized with from 2 to 12% by weight of a dicarboxylic acid selected from the group consisting of adipic acid, sebacic acid, glutaric acid, azelaic acid and isophthalic acid and (b) a polyester homopolymer selected from the group consisting of poly(trimethylene terephthalate), poly(tetramethylene terephthalate) and poly(hexamethylene terephthalate), said polyester homopolymer being present in weight percentages of from 1 to 10% based on the total weight of the copolymer, said component (a) being produced by preparing a terephthalate ester melt and, prior to polymerization thereof, adding said dicarboxylic acid to the melt and then polymerizing the melt.

4,167,542

POLYESTER RESIN COMPOSITIONS CONTAINING DICYCLOPENTADIENE ALKENOATE

Donald L. Nelson, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 814,359, Jul. 11, 1977, abandoned. This application Oct. 23, 1978, Ser. No. 953,678

Int. Cl.[2] **C08L** *67/06*

U.S. Cl. 525—445 **8 Claims**

1. A thermosetting resin composition which comprises

(A) about 80 to about 30% by weight of a linear unsaturated polyester containing 10 to 100 mole percent of a dicyclopentadiene concentrate based on the moles of dicarboxylic acid or anhydride contained in said polyester,

(B) about 20 to about 70% by weight of an unsaturated

monomer mixture of a vinyl aromatic monomer and a dicyclopentadiene alkenoate wherein the range of dicyclopentadiene alkenoate in said mixture ranges from about 5 to about 90 weight percent.

4,167,543

THERMOPLASTIC MOLDING COMPOSITIONS

Lothar Liebig; Frank Wingler; Karl-Heinz Ott, all of Leverkusen; Gert Humme, Odenthal, and Alfred Pischtschan, Kuerten, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 20, 1978, Ser. No. 953,008

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1977, 2747822

Int. Cl.² C08L *51/04*

U.S. Cl. 525—74 **1 Claim**

1. Thermoplastic moulding compositions of

(A) 25 to 95% by weight of a graft polymer of 70 to 30% by weight of a mixture of 95 to 50% by weight of styrene and 5 to 50% by weight of acrylonitrile on 30 to 70% by weight of polybutadiene or a butadiene-styrene copolymer, and

(B) 5 to 75% by weight of a terpolymer of acrylontrile, maleic acid anhydride and styrene,

characterised in that the terpolymer contains 10 to 30 parts by weight of acrylonitrile, 7.5 to 15 parts by weight of maleic acid anhydride, and 82.5 to 55 parts by weight of styrene, in copolymerised form and is produced by continuous bulk polymerisation in an ideally mixed tank reactor under stationary conditions and with incomplete conversions of from 25 to 60 mole %, with volume time yields of from 200 to 2000 g/l and at temperatures of from 60 to 150° C. in the presence of from 0.01 to 0.5% by weight, based on monomers, of an initiator decomposing into radicals with a decomposition rate constant at 100° C. of greater than 5×10^{-3} sec.$^{-1}$ and, in another continuous process step, is freed from the residual monomers to a content of less than 0.1% by weight, based on the terpolymer.

4,167,544

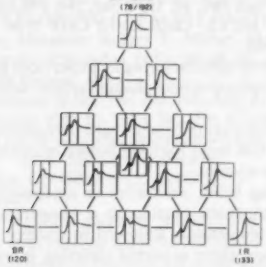
POLYMER BLENDS

Alonso R. Ramos, Nendorf, France, and Robert E. Cohen, Jamaica Plain, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 23, 1978, Ser. No. 936,142

Int. Cl.² C08L *9/00, 53/00*

U.S. Cl. 525—99 **4 Claims**



1. A homogeneous composition comprising a diblock copolymer of isoprene and butadiene, and a homopolymer constituent selected from the group consisting of polyisoprene, polybutadiene and mixtures thereof wherein the average molecular weight of the homopolymer constituent is within the range of about 50 to 1000% of the average molecular weight of the corresponding polyisoprene or polybutadiene chain of the diblock copolymer.

4,167,545

BRANCHED BLOCK COPOLYMERS AND THEIR MANUFACTURE

Gerhard Fahrbach, Plankstadt; Karl Gerberding; Erhard Seiler, both of Ludwigshafen, and Dieter Stein, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 732,900, Oct. 15, 1976, abandoned. This application Apr. 14, 1978, Ser. No. 896,478

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1975, 2550227

Int. Cl.² C08F *297/04*

U.S. Cl. 525—122 **12 Claims**

1. Branched block copolymers of from 60 to 95 percent by weight of a monovinyl-aromatic compound and from 40 to 5 percent by weight of a conjugated diene of 4 to 8 carbon atoms, which have an average structure of the general formula

$$(A^1—A^2—B\rightarrow A^3)_n—X—(A^3\leftarrow B—A^2)_m$$

where A^1, A^2 and A^3 are non-elastomeric polymer segments based on the monovinyl-aromatic compound and the B's are elastomeric polymer segments based on the conjugated diene, m and n are numbers, m being equal to or greater than n and the sum of m and n being at least 3, and X is the radical of a polyfunctional coupling agent by means of which the linear polymer blocks ($A^1—A^2—B\rightarrow A^3$) and ($A^2—B\rightarrow A^3$), which form the branches, are chemically bonded to one another at the polymer segments A^3, with the provisos that the polymer segment or segments A^1 contains or contain from 50 to 80 percent by weight, the polymer segments A^2 from 1 to 30 percent by weight, but the polymer segments A^1 and A^2 together not more than 90 percent by weight, of the total monovinyl-aromatic compound of the branched block copolymer, as copolymerized units, the transition between the polymer segments A^2 and B is sharp and the transition between the polymer segments B and A^3 is gradual.

4,167,546

ADHESIVE COMPOSITION

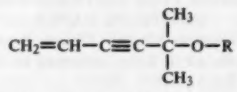
Vasily V. Korshak, ulitsa Gubkina, 4, kv. 81; Antonina M. Polyakova, ulitsa Vavilova, 55/7, kv. 54; Maria D. Suchkova, ulitsa Obrucheva, 28, korpus 3, kv. 220, and Kira A. Mager, Beskudnikovsky bulvar, 10, korpus 11, kv. 44, all of, Moscow, U.S.S.R.

Filed May 30, 1978, Ser. No. 911,416

Int. Cl.² C08F *214/18;* C08L *35/04, 35/08*

U.S. Cl. 525—275 **4 Claims**

1. An adhesive composition based on a monomeric ester of α-cyanacrylic acid selected from the group consisting of ethyl ester, butyl ester, n-hexyl ester and benzyl ester and a modifying agent, which is a monomeric fluorinated ether of dimethylvinylethylnylcarbinol of the formula:



wherein R is $CH_2(CF_2)_nH$ or $CH_2(CF_2)_nCF_3$; n=2 to 10, wherein said composition consists of 70 to 95% by weight of said monomeric ester of α-cyanacrylic acid and 30 to 5% by weight of said monomeric fluorinated ether of dimethylvinylethynylcarbinol with the kinematic viscosity of the composition variable within the range of from 2 to 5 centi Stokes.

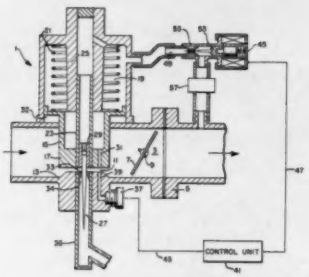
2. An adhesive composition as in claim 1, further comprising in addition to said monomeric esters, polymers of said esters; with kinematic viscosity of the composition variable within the range of from 15 to 100 centi Stokes.

4,167,547

AIR VALVE TYPE CARBURETOR

Takeshi Takamaru, and Tohru Nakagawa, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 18, 1978, Ser. No. 943,130
Claims priority, application Japan, Sep. 17, 1977, 52-111767
Int. Cl.[2] F02M *9/06*
U.S. Cl. 261—44 C **5 Claims**



1. An air valve type carburetor comprising:
a suction passage disposed substantially horizontally for introducing air and fuel into an engine;
a throttle valve disposed in the suction passage for controlling air and fuel introduced into the engine;
a venturi portion defined in the suction passage upstream of the throttle valve;
a fuel passage provided in the venturi portion for supplying fuel into the suction passage;
a suction chamber provided on the outside of the suction passage at the venturi portion;
a suction piston one end of which is disposed slidibly in the suction chamber and the other end of which is disposed in the suction passage so as to face the fuel passage and has an aperture through which the suction chamber communicates with the suction passage at the venturi portion;
a spring disposed in the suction chamber for urging the suction piston downward;
a jet needle provided on the lower end of the suction piston so that the jet needle will be inserted in the fuel passage, for regulating fuel flowing in the fuel passage;
means for detecting pressure in the venturi portion;
passage means for communicating between the suction chamber and the suction passage downstream of the throttle valve; and
means connected to both the passage means and the means for detecting pressure, for controlling vacuum passing through the passage means so that the pressure in the venturi portion will be constant.

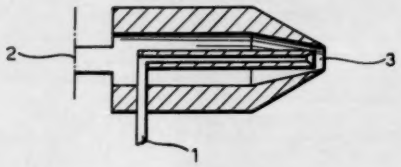
4,167,548

PROCESS FOR THE MANUFACTURE OF A MICROFIBROUS PULP SUITABLE FOR MAKING SYNTHETIC PAPER

Guido Arduini, Cormano; Marcello Ghirga, Bresso, and Gaspare Renda, Legnano, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Oct. 25, 1974, Ser. No. 518,117
Claims priority, application Italy, Nov. 8, 1973, 31051 A/73
Int. Cl.[2] B22D *23/08*
U.S. Cl. 264—12 **23 Claims**

1. A method for preparing an amorphous microfibrous pulp suitable for use in the manufacture of synthetic paper, comprising the steps of:
(a) forming an aqueous emulsion of a solution in an organic solvent of a polymerization product of at least one polymer having a molecular weight of from 10^3 to 10^6 selected from the group consisting of olefinic homopolymers, olefinic copolymers, copolymers of at least one olefinic monomer with at least one further monomer copolymerizable therewith and mixtures thereof;
(b) heating said emulsion above the melting point of the polymerization product;
(c) spraying the hot emulsion in the form of a tubular jet into



a zone of expansion in which water and the organic solvent are evaporated from the spray;
(d) injecting into the cavity of the tubular jet substantially coaxially with the tubular jet a stream of inert gas to spread the jet transversely of the length of the jet in said zone of expansion.

4,167,549

PARTING AGENT FOR MOLDS USED IN FORMING CONCRETE AND METHOD OF USE

Jacob J. Creskoff, 200 N. Wynnewood Ave., Wynnewood, Pa. 19096

Filed Mar. 11, 1974, Ser. No. 450,119
Int. Cl.[2] B28B *1/50*
U.S. Cl. 264—42 **6 Claims**

1. A method of removing a concrete casting from a mold comprising applying to said mold a coating of a parting agent which is no more than 0.01 inch in thickness, said parting agent including an effective amount of an acid, an effective amount of an ingredient which will react with the cement of the concrete to form a multitude of tiny bubbles on the surface of the concrete and a vehicle therefor, said ingredient which will react with the cement of the concrete comprising a petroleum hydrocarbon insoluble fraction of a coal-tar hydrocarbon extract of pinewood, introducing concrete mix into said mold, curing said concrete mix to form a casting and removing said casting from said mold.

4,167,550

METHODS OF MANUFACTURE OF BETA-ALUMINA

James H. Duncan, Stafford, England, assignor to Chloride Silent Power Limited, London, England

Filed Jan. 18, 1978, Ser. No. 870,535
Int. Cl.[2] C04B *35/10*; C01F *7/04*
U.S. Cl. 264—66 **34 Claims**

1. A method of manufacturing an impervious polycrystalline cationically conductive beta-alumina article, said method comprising
sintering a compact of beta-alumina particles or a compact of particles that react together before or during sintering to form beta-alumina;
said sintering being conducted in successive cycles, each cycle comprising heating to a temperature above the sintering temperature followed by cooling of at least 25° C., wherein there is partial sintering in each cycle and completion of sintering in a last cycle; and
wherein said heating and said cooling are carried out at temperatures and for times sufficient to densify said article; and
wherein grain growth is reduced or eliminated while permitting phase conversion from β to β'' phase to continue by cooling between periods of partial sintering;
and further wherein not more than 95% of overall linear shrinkage occurring during said sintering takes place during any one cycle of heating followed by cooling.

4,167,551

PROCESS FOR THE PRODUCTION OF AN ION EXCHANGE MEMBRANE

Noriyoshi Tamura, and Kunio Kihara, both of Ami, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Continuation of Ser. No. 620,852, Oct. 8, 1975, abandoned. This application Jul. 15, 1977, Ser. No. 816,199

Claims priority, application Japan, Oct. 21, 1974, 49-120330; Feb. 25, 1975, 50-22460

Int. Cl.[2] C08J 5/22

U.S. Cl. 521—27 11 Claims

1. A process for preparing a heterogeneous ion exchange membrane having a high ion transport number in the presence of a high ion concentration, which comprises mixing 2–8 parts by weight of a finely powdered ion exchange resin with 2–8 parts by weight of a crystalline polyolefin resin, forming the resultant mixture into a membrane-shaped article and treating the membrane-shaped article with an aqueous solution of a salt component which is at least one member selected from the group consisting of alkali metal salts and ammonium salts, at a temperature of at least 80° C. for at least 10 minutes, the concentration of said salt component in the aqueous solution being from 17% by weight to saturation.

4,167,552

THERMOSETTABLE RESIN MOLDING COMPOUND

Tadahiko Hayashi, Chiba, Japan, assignor to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Sep. 19, 1977, Ser. No. 834,264

Claims priority, application Japan, Sep. 24, 1976, 51-113710

Int. Cl.[2] B29G 3/00

U.S. Cl. 264—328 8 Claims

1. A method for screw injection molding an article which comprises:

inserting into a screw injection molding apparatus a multiplicity of pellets each having a weight of less than 20 g; wherein said pellets comprise a liquid thermosettable resin composition and a filler, said pellets being surface-coated with a non-tacky coating of less than about 50 micron thickness and injecting said pellets without peeling off the non-tacky coat into a mold whereby said surface coating is sheared such that said liquid fills said mold whereby a molded article is formed having a weight of more than several times the weight of one pellet; and wherein said molded article contains said non-tacky coat uniformly and thoroughly mixed therein.

4,167,553

CATALYTIC REACTION CHAMBER FOR GRAVITY-FLOWING CATALYST PARTICLES

Paul J. Persico, Hinsdale; Robert F. Millar, Mc Cook, and Robert H. Jensen, Clarendon Hills, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 822,164, Aug. 5, 1977. This application Feb. 13, 1978, Ser. No. 877,586

The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.

Int. Cl.[2] B01J 8/12; C10G 35/12

U.S. Cl. 422—216 12 Claims

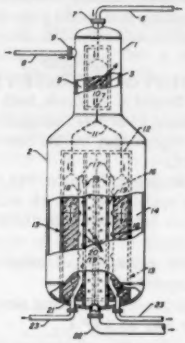
1. A catalytic reaction chamber for effecting contact of a reactant stream with catalyst particles which are (1) disposed therein as an annular-form bed and, (2) downwardly movable therethrough via gravity-flow, said reaction chamber comprising, in cooperative relationship:

(a) an outer, perforated catalyst-retaining screen (i) concentrically-disposed within and, (ii) having a cross-sectional area less than said chamber to provide a reactant stream manifold space therebetween;

(b) an inner, perforated scalloped centerpipe (i) concentrically-disposed within and, (ii) having a cross-sectional area less than said catalyst-retaining screen to provide said annular-form catalyst bed therebetween;

(c) a plurality of catalyst inlet conduits connected to the upper portion of said chamber and communicating with said annular-form catalyst bed; and,

(d) a plurality of vertically-positioned catalyst-transfer conduits (i) circumferentially-disposed substantially adjacent



the outer surface of said scalloped centerpipe, (ii) extending substantially the entire length of said annular-form catalyst bed and, (iii) containing a first plurality of apertures facing into said catalyst bed and sized to permit catalyst particles to flow therethrough, and a second plurality of apertures facing said perforated centerpipe and sized to inhibit the flow of catalyst particles therethrough.

4,167,554

CRYSTALLIZATION APPARATUS HAVING FLOATING DIE MEMBER WITH TAPERED APERTURE

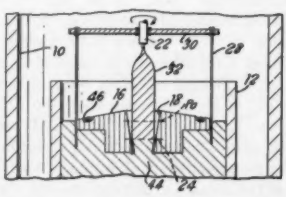
Colin Fisher, Royston, England, assignor to Metals Research Limited, Herts, England

Division of Ser. No. 622,464, Oct. 15, 1975. This application May 26, 1977, Ser. No. 800,866

Claims priority, application United Kingdom, Oct. 16, 1974, 44792/74

Int. Cl.[2] B01J 17/18

U.S. Cl. 422—246 10 Claims



1. Apparatus for producing a crystal comprising a container, means for forming a melt of crystallizable material in said container, a plate member for floating on the melt in said container and having a downwardly inwardly tapering central aperture of constant slope of circular cross section wherein the inside surface of said passageway is not wetted by the melt so as to form a meniscus, a seeding device, a pulling means for producing relative movement between the seeding device and the container to allow the seeding device to be dipped into the melt and withdrawn to pull crystallized material from the melt and, means for controlling the thermal conditions within the container wherein the improvement comprises:

(a) the buoyancy and weight of the member are such that it will float partially submerged and remain floating thus on the melt as crystallized material is pulled from the melt,

(b) the length of the passageway is such that a range of positions of the meniscus datum can be contained within the length of the passageway,

(c) means for rotating said seeding device and,

(d) means for centering the central aperature of said plate member about the axis of rotation of said rotating means comprising peripheral downwardly extending abutments slidingly engaged on said plate member, and engagement means to engage said abutments which engagement means is attached to and relatively rotatable with respect to said means for rotating said seeding device.

4,167,555

EXTRACTION OF TUNGSTEN FROM ORES

John M. Gomes; Daniel A. O'Keefe, both of Reno, and Andrea E. Raddatz, Sparks, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 912,264, Jun. 5, 1978, abandoned. This application Dec. 15, 1978, Ser. No. 969,768

Int. Cl.[2] C01G *41/00*

U.S. Cl. 423—53 **2 Claims**

1. A process for extraction of tungsten from hot springs tungsten ores comprising:

(a) calcining the ore in an oxidizing atmosphere at a temperature of about 800° to 950° C.,

(b) rapidly quenching the calcined ore in an aqueous solution of an inorganic alkali metal or ammonium compound selected from the group consisting of carbonates, hydroxides, acetates, sulfates, borates, phosphates and mixtures thereof, at essentially ambient conditions of temperature and pressure, and

(c) treating the resulting slurry at a temperature of about 180° to 300° C. and a pressure of about 200 to 500 psi for a time sufficient to extract a major proportion of tungsten from the ore.

4,167,556

DETERMINATION OF TRANSCOBALAMINS

Jacob Selhub, Chicago, Ill.; Bracha Rachmilewitz, and Nathan Grossowicz, both of Jerusalem, Israel, assignors to Yissum Research Development Company of the Hebrew University of Jerusalem, Jerusalem, Israel

Filed Jun. 2, 1977, Ser. No. 802,379

Int. Cl.[2] G01N *33/16*; B65D *69/00*

U.S. Cl. 424—1 **13 Claims**

1. A process for the quantitative determination of each of the three transcobalamins TC-I, TC-II, and TC-III in serum, which comprises incubating a predetermined quantity of serum with a solution of ^{57}Co Vitamin B-12, passing the resulting solution through adsorption means adapted to selectively adsorb TC-II on a charged cellulose filter or equivalent mini-column at a pH of about 8.5; adsorbing the TC-I and TC-III constituents on a cellulose filter of the DEAE-cellulose type or an equivalent mini-column; selectively desorbing the TC-III by means of a monopotassium phosphate solution of about 0.05 M and at a pH of about 4.6, and determining the radioactivity of each of the three transcobalamin fractions thus obtained, indicating the individual and total unsaturated B-12 binding capacity (UBBC) of the three transcobalamins.

4,167,557

UBIQUITOUS IMMUNOPOIETIC POLYPEPTIDE (UBIP) AND METHODS

Gideon Goldstein, Riverdale, N.Y., assignor to Sloan-Kettering Institute for Cancer Research, New York, N.Y.

Continuation-in-part of Ser. No. 606,844, Aug. 22, 1975, Pat. No. 4,002,602, which is a continuation-in-part of Ser. No. 449,686, Mar. 11, 1974, abandoned. This application Jan. 10, 1977, Ser. No. 758,243

The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.

Int. Cl.[2] A61K *43/00*; G01N *33/00*

U.S. Cl. 424—1 **15 Claims**

1. A therapeutic composition of matter comprising a therapeutically effective amount of the polypeptide

H2N-MET-GLN-ILE-PHE-VAL-LYS-THR-LEU-THR-GLY-LYS-THR-ILE-THR-LEU-GLU-VAL-GLU-PRO-SER-ASP-THR-ILE-GLU-ASN-VAL-LYS-ALA-LYS-ILE-GLN-ASP-LYS-GLU-GLY-ILE-PRO-PRO-ASP-GLN-GLN-ARG-LEU-ILE-PHE-ALA-GLY-LYS-GLN-LEU-GLU-ASP-GLY-ARG-THR-LEU-SER-ASP-TYR-ASN-ILE-GLN-LYS-GLU-SER-THR-LEU-HIS-LEU-VAL-LEU-ARG-LEU-ARG-COOH.

in a pharmaceutically acceptable carrier.

13. A method for measuring levels of vital materials in fluids which comprises reacting the polypeptide defined in claim 1 with a radioactive compound by chemical placement to form a labeled radioactive polypeptide molecule; preparing antibodies to the labeled radioactive polypeptide molecule, and contacting said labeled radioactive polypeptide molecule and antibodies with the fluid by radioimmunoassay techniques or radioligand displacement techniques by measurement of the binding of labeled or unlabeled polypeptide.

4,167,558

NOVEL SUSTAINED RELEASE TABLET FORMULATIONS

Prabhakar R. Sheth, Pearl River, N.Y., and Jacques L. Tossounian, Pine Brook, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 872,181, Jan. 25, 1978, Pat. No. 4,140,755, which is a continuation of Ser. No. 658,003, Feb. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 559,107, Mar. 17, 1975, abandoned. This application Nov. 6, 1978, Ser. No. 957,948

Int. Cl.[2] A61K *9/22, 9/26, 31/60*

U.S. Cl. 424—22 **2 Claims**

1. A sustained release pharmaceutical tablet containing as the active ingredient acetylsalicylic acid, said tablet being hydrodynamically balanced so that, upon contact with gastric fluid, said tablet acquires and maintains a bulk density of less than one thereby being buoyant in said fluid and remaining buoyant in the gastric fluid of the stomach until substantially all of the acetylsalicylic acid contained therein has been released therefrom, said tablet comprising a homogeneous mixture of acetylsalicylic acid, from about 0% to about 80% by weight of therapeutically inert, pharmaceutically acceptable adjunct materials, and from about 20% by weight to about 75% by weight of one or a mixture of hydrocolloids selected from the group consisting of methyl cellulose, hydroxypropylcellulose, hydroxypropylmethylcellulose, hydroxyethylcellulose and sodium carboxymethylcellulose to provide, upon contact with gastric fluid, a water impermeable barrier on the surface of said tablet, said tablet being compressed to a hardness of from about 5 to about 6 S.C.U.

4,167,559

DEODORIZING BREATH COMPOSITION

George H. Michel, 343 Oak Knoll Dr., Glendora, Calif. 91740

Filed Apr. 22, 1977, Ser. No. 790,041

Int. Cl.[2] A61K *7/26, 9/68*; C07J *00/00*

U.S. Cl. 424—58 **7 Claims**

1. A breath deodorizing composition comprising from 1.0–90.0% by weight of the 50% solids extract from the *Yucca Brevifolia* or *Schidigera* plant, dried to approximately 3% moisture content, blended with from 10.0 to 90.0% of a food grade vegetable protein.

4,167,560

POLYVALENT SHIPPING FEVER VACCINE

Wilson H. Wohler, Jr., San Angelo, Tex., assignor to Texas Vet Lab, Inc., San Angelo, Tex.

Filed Apr. 12, 1977, Ser. No. 786,940
Int. Cl.[2] A61K *39/02*
U.S. Cl. 424—92 4 Claims

1. A method for prophylactically and therapeutically treating livestock for selected specific disease entities that constitute either individually or in combination the bacterial phase of the shipping disease syndrome prior to exposure, during incubation, or during the symptomatic phase of the disease, which method comprises:

administering to said livestock subcutaneously into the lymph drainage of the cervical region an effective amount of a water-in-oil emulsion having suspended in the aqueous phase thereof a mixture consisting essentially of the killed forms of *Pasteurella multocida, Pasteurella hemolytica,* and *Salmonella typhimurium.*

4,167,561

HYPOCHLORITE DISINFECTING COMPOSITIONS AND USE THEREOF

Vincent Lamberti, Upper Saddle River; Mark D. Konort, Haworth, and Beth A. DiLorenzo, Ridgewood, all of N.J., assignors to Lever Brothers Company, New York, N.Y.

Continuation-in-part of Ser. No. 429,453, Dec. 28, 1973, abandoned. This application Jun. 9, 1975, Ser. No. 583,360
Claims priority, application Canada, Dec. 24, 1974, 216933
Int. Cl.[2] A01N *11/00*
U.S. Cl. 424—149 8 Claims

1. A process for disinfecting a surface with an inorganic hypochlorite solution which process insures destruction of a substantial amount of said hypochlorite after said disinfection comprising:

(i) contacting said surface with an aqueous solution consisting essentially of a disinfecting amount of said inorganic hypochlorite having a cation associated therewith, said cation being selected from the group consisting of alkali metal, alkaline earth metal, hydrogen and mixtures thereof and an alkali metal or alkaline earth metal alpha-hydroxy-beta-sulfosuccinate, the molar ratio of said hypochlorite to said alpha-hydroxy-beta-sulfosuccinate being about 0.01 to 1 to about 2 to 1 and said solution having a pH of about 2 to about 9.5, and

(ii) heating said solution until at least about 75% of said inorganic hypochlorite is destroyed.

4,167,562

METHOD AND COMPOSITION FOR TREATING ARTERIOSCLEROSIS

H. Ray Evers, P. O. Box 2805, Montgomery, Ala. 36105

Filed Aug. 28, 1978, Ser. No. 937,533
Int. Cl.[2] A61K *33/14, 37/40, 31/725, 31/68*
U.S. Cl. 424—153 11 Claims

1. An intravenous solution for the treatment of arteriosclerosis, said solution consisting essentially of the following per 10 ml of standard Ringers injection:

a. B-complex: 1,000–5,000 mg
b. Hydrochloric acid U.S.P.: 10–40 mg
c. Sodium ascorbate: 500–25,000 mg
d. Pyridoxine hydrochloride: 500–5,000 mg
e. Magnesium sulfate: 100–2,500 mg
f. Adrenal cortex: 250–2,500 mcg
g. Magnesium chloride: 250–5,000 mg
h. Thiamin: 100–2,000 mg
i. Heparin sodium: 2,500–25,000 U.S.P. units
j. Calcium gluconate: 250–2,500 mg
k. Calcium d-saccharate: 1.6–5.0 mg.

4,167,563

TRH SOLUTION

Yasushi Mikura, Senriyamahigashi; Yoshiharu Matukura, Izumoihonmachi, and Hiroshi Fujisawa, Uenohigashi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sep. 22, 1977, Ser. No. 835,815
Claims priority, application Japan, Oct. 1, 1976, 51-118875
Int. Cl.[2] A61K *37/02*
U.S. Cl. 424—177 9 Claims

1. An injectable solution, which contains L-pyroglutamyl-L-histidyl-L-prolinamide or its physiologically acceptable salt in an amount within the range of about 0.01 to about 5 percent, on a weight/volume basis, in terms of free L-pyroglutamyl-L-histidyl-L-prolinamide, and a sugar alcohol selected from the group consisting of a hexitol, a pentitol and inositol in an amount within the range of about 2 to about 9 percent on a weight/volume basis, said solution being free from sodium chloride.

4,167,564

BIOLOGICAL ASSIMILATION OF METALS

Ned L. Jensen, Clearfield, Utah, assignor to Albion Laboratories, Inc., Clearfield, Utah

Filed Sep. 23, 1974, Ser. No. 508,067
Int. Cl.[2] A61K *37/00, 31/555, 31/28, 31/315*
U.S. Cl. 424—177 16 Claims

1. A stabilized metal proteinate for enhancing the uptake of essential minerals into warm blooded animals comprising a metal coordination complex between a metal ion selected from the group consisting of iron, copper, zinc, manganese, cobalt, chromium, calcium, magnesium and vanadium, and an amino acid selected from group consisting of glycine, alanine, valine, leucine, isoleucine, phenylalanine, tyrosine, tryptophan, serine, threonine, aspartic acid, glutamic acid, lysine, arginine, histidine, cystine, cysteine, methionine, proline, hydroxyproline and mixtures thereof, the proteins made up from said amino acids and hydrolysis products of such proteins in a molar ratio of between two and sixteen moles of amino acid, protein or hydrolyzed protein per mole of metal, said metal being stabilized by a buffering system comprising a member or members selected from the group consisting of amino acid-hydrochloric acid mixtures, or amino acid-sodium hydroxide mixtures and mixtures of alkali or alkaline earth metal salts of acid phthalates, neutralized phthalates, acid phosphates and acid carbonates with hydrochloric acid, sodium hydroxide and alkali or alkaline earth metal salts of acid phosphates, phosphates and carbonates, wherein the buffering system maintains the metal proteinate at a relatively constant pH between about 7 and 11.

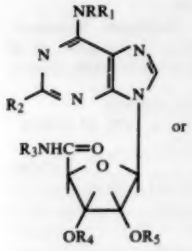
4,167,565

ADENOSINE-5′-CARBOXAMIDES AND METHOD OF USE

Herman H. Stein, Skokie, Ill.; Raj N. Prasad, Pierrefonds, Canada; Karin R. Tietje, Philipsburg, Canada, and Anthony K. L. Fung, Pierrefonds, Canada, assignors to Abbott Laboratories, North Chicago, Ill.

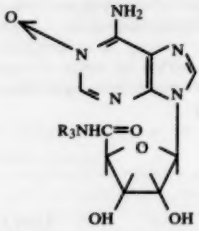
Filed Nov. 8, 1976, Ser. No. 739,684
Int. Cl.[2] A61K *31/52;* C07H *19/16*
U.S. Cl. 424—180 15 Claims

1. A method of eliminating undesired animals selected from the group consisting of rodents, coyotes and birds which are economically or socially destructive to man, which method comprises administering to said animals a lethal dose of a compound represented by the formulae



(1)

or



(2)

wherein R is H, loweralkyl of 1 to 6 carbon atoms or acetyl; R_1 is H or acetyl; R_2 is H, Cl or NH_2; R_3 is H, loweralkyl of 1 to 6 carbon atoms, alkoxy of no more than 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or hydroxyalkyl of 1 to 6 carbon atoms; R_4 and R_5 are each H, acetyl or propionyl, or when taken together form a p-chlorobenzylidene, a carbonate or an ethoxymethylene moiety; in a suitable carrier.

4,167,566

ANTITHROMBOTIC 2-PRENYL-3-OXO-5,6-DIARYL-AS-TRIAZENES

Guy Pitet, Toulouse; Henri Cousse, Castres; Gilbert Mouzin, Castres, and Andre' Delhon, Castres, all of France, assignors to Pierre Fabre, S.A., France

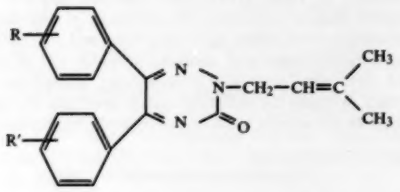
Filed Mar. 9, 1978, Ser. No. 884,733

Claims priority, application France, Mar. 9, 1977, 77 07245

Int. Cl.[2] C07D *253/06;* **A61K** *31/53*

U.S. Cl. 42—249 **8 Claims**

1. A compound of the formula



in which R and R′ are identical or different and are selected from the group consisting of lower alkyl having 1 to 5 carbon atoms, dialkyl amino, alkoxy, halogen, and hydroxy.

6. A method for the control of thrombosis in a patient subject thereto, comprising the step of administering to the said patient a compound of claim 1 in an antithrombotic amount.

4,167,567

ANTIHYPERTENSIVE 4-AMINOQUINOLINES

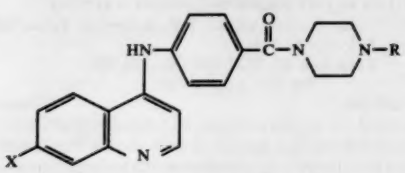
John M. McCall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 5, 1978, Ser. No. 903,082

Int. Cl.[2] A61K *31/495;* **C07D** *401/12, 401/14*

U.S. Cl. 424—250 **39 Claims**

1. A compound of the formula II



II

wherein X is chloro or trifluoromethyl;

wherein R is

(a) triazinyl;

(b) pyrazinyl;

(c) pyrimidinyl;

(d) triazinyl, pyrazinyl, or pyrimidinyl substituted by one or two trifluoromethyl, alkyl, alkoxy, dialkylamino, alkylthio, or halo, wherein halo is fluoro, bromo, or iodo, wherein alkyl is of one to 3 carbon atoms, and wherein alkoxy is of one to 3 carbon atoms;

(e) halopyridinyl of 1 to 4 halo atoms;

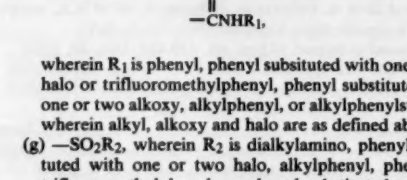
(f)

wherein R_1 is phenyl, phenyl subsituted with one or two halo or trifluoromethylphenyl, phenyl substituted with one or two alkoxy, alkylphenyl, or alkylphenylsulfonyl, wherein alkyl, alkoxy and halo are as defined above; or

(g) $—SO_2R_2$, wherein R_2 is dialkylamino, phenyl substituted with one or two halo, alkylphenyl, phenyl, or trifluoromethylphenyl, or phenyl substituted with one or two alkoxy groups; wherein alkyl, alkoxy, and halo are as defined above;

or the pharmacologically acceptable acid addition salts thereof.

18. A pharmaceutical dosage unit form for systemic administration to alleviate hypertension consisting essentially of an effective non-toxic amount of a compound of the formula



II

wherein X is chloro or trifluoromethyl;

wherein R is

(a) triazinyl;

(b) pyrazinyl;

(c) pyrimidinyl;

(d) triazinyl, pyrazinyl, or pyrimidinyl substituted by one or two trifluoromethyl, alkyl, alkoxy, dialkylamino, alkylthio, or halo, wherein halo is fluoro, bromo, or iodo, wherein alkyl is of one to 3 carbon atoms, and wherein alkoxy is of one to 3 carbon atoms;

(e) halopyridinyl of 1 to 4 halo atoms;

(f)

wherein R_1 is phenyl, phenyl substituted with one or two halo or trifluoromethylphenyl, phenyl substituted with one or two alkoxy, alkylphenyl, or alkylphenylsul-

fonyl, wherein alkyl, alkoxy and halo are as defined above; or

(g) $-SO_2R_2$, wherein R_2 is dialkylamino, phenyl substituted with one or two halo, alkylphenyl, phenyl, or trifluoromethylphenyl, or phenyl substituted with one or two alkoxy groups; wherein alkyl, alkoxy, and halo are as defined above;

or the pharmacologically acceptable acid addition salts thereof.

4,167,568

8-AZAPURIN-6-ONE DERIVATIVES

Philip Knowles, Rayleigh; Edward Lunt, Westcliff-on-Sea; Stuart M. Marshall, Stanford-le-Hope, and Roger E. Ford, Gidea Park, all of England, assignors to May & Baker Limited, Essex, England

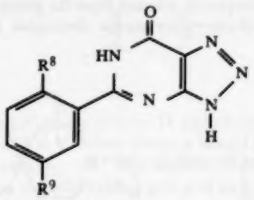
Filed Oct. 20, 1977, Ser. No. 843,786

Claims priority, application United Kingdom, Oct. 22, 1976, 44008/76

Int. Cl.[2] **C07D** *487/04;* **A61K** *31/41, 31/505*

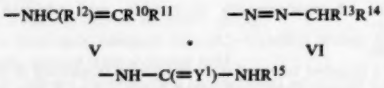
U.S. Cl. 424—251 **30 Claims**

1. An 8-azapurin-6-one of the formula:

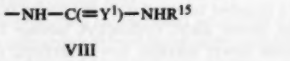


IV

wherein R^8 represents alkoxy of from 1 to 6 carbon atoms, and R^9 represents a group of the formula V, VI, or VIII indicated below:



V VI



VIII

wherein R^{10}, R^{13} and R^{14} each represents cyano, or alkanoyl or alkoxycarbonyl of from 2 to 6 carbon atoms, R^{11} represents hydrogen, cyano, or alkanoyl or alkoxycarbonyl of from 2 to 6 carbon atoms, R^{12} represents hydrogen or, when R^{11} represents hydrogen, R^{12} represents alkyl of from 1 to 6 carbon atoms or alkoxycarbonyl of from 2 to 6 carbon atoms, or the pair of symbols R^{11} and R^{12} form together an alkylene chain of the formula $-(C_qH_{2q})-$ wherein q is an integer from 3 to 6, R^{15} represents hydrogen or alkyl of from 1 to 6 carbon atoms, and Y^1 represents oxygen or sulphur, and pharmaceutically acceptable salts thereof.

4,167,569

PYRIMIDO[1,2 - a]BENZIMIDAZOLE DERIVATIVES

Stuart D. Mills, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

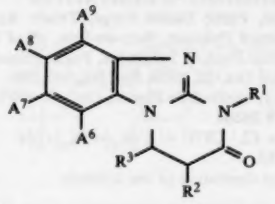
Filed Nov. 23, 1977, Ser. No. 855,003

Claims priority, application United Kingdom, Dec. 9, 1976, 51426/76; Aug. 9, 1977, 33341/77

Int. Cl.[2] **C07D** *487/04, 491/14;* **A61K** *31/505*

U.S. Cl. 424—251 **15 Claims**

1. A pyrimido[1,2-a]benzimidazole derivative of the formula:



I

wherein R^1 is hydrogen, or a C_{1-6}-alkyl radical; R^2 and R^3, which may be the same or different, are hydrogen or C_{1-6}-alkyl radicals; one or two of A^6, A^7, A^8 and A^9, which may be the same or different, are halogen atoms, C_{1-6}-alkyl, C_{1-6}-alkoxy, C_{2-6}-alkanoyl, 1-(hydroxy)-C_{1-6}-alkyl, C_{1-6}-alkylthio, C_{1-6}-alkylsulphinyl or cyano radicals, or benzoyl radicals optionally substituted by a halogen atom, a C_{1-6}-alkoxy or C_{1-6}-alkyl radical, and the remainder of A^6, A^7, A^8 and A^9 are hydrogen; or an adjacent pair of A^6, A^7, A^8 and A^9 together constitute a C_{1-6}-alkylenedioxy diradical, and the remainder of A^6, A^7, A^8 and A^9 is hydrogen; provided that when only one of A^6, A^7, A^8 and A^9 is a halogen atom, C_{1-6}-alkyl or C_{1-6}-alkoxy radical one of the remainder of A^6, A^7, A^8 and A^9 is other than hydrogen.

11. A pharmaceutical composition for use in inhibiting the aggregation of blood platelets which comprises an effective amount of a compound of formula I as claimed in claim 1 together with a pharmaceutically acceptable diluent or carrier.

4,167,570

2-METHYL-6-ALKYL-11-AMINOALKYL-6,11-DIHYDRO-5H-PYRIDO(2,3-B)(1,5)BENZODIAZEPIN-5-ONES AND SALTS THEREOF

Günther Schmidt; Sigfrid Püschmann, and Günther Engelhardt, all of Biberach, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

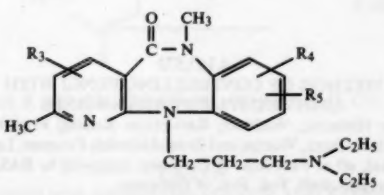
Filed Sep. 28, 1977, Ser. No. 837,578

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1976, 2644121

Int. Cl.[2] **A61K** *31/55;* **C07D** *471/04*

U.S. Cl. 424—256 **5 Claims**

1. A compound of the formula



wherein R_3, R_4 and R_5 are each hydrogen or methyl, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

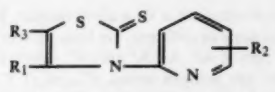
4. A bronchospasmolytic and bronchosecretolytic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective bronchospasmolytic and bronchosecretolytic amount of a compound of claim 1.

4,167,571
THIAZOLINE DERIVATIVES

Jean D. Bourzat, Paris; Daniel Farge, Thiais; André Léger, Paris, and Gerard Ponsinet, Sucy-en-Brie, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 17, 1978, Ser. No. 952,198
Claims priority, application France, Oct. 19, 1977, 77 31431; Sep. 13, 1978, 78 26304
Int. Cl.[2] C07D *417/04;* A61K *31/44*
U.S. Cl. 424—263 21 Claims

1. A thiazoline derivative of the formula:



I

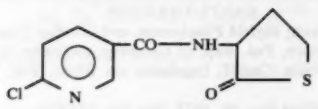
wherein R_1 represents hydrogen, an alkyl radical of 1 or 2 carbon atoms or methoxymethyl, R_2 represents an alkyl radical of 1 or 2 carbon atoms in the 4-, 5- or 6-position, and R_3 represents methyl, or alternatively R_3 represents hydrogen and either R_1 represents hydrogen, an alkyl radical of 1 through 4 carbon atoms, or an alkoxymethyl radical in which the alkyl moiety contains 1 through 4 carbon atoms and R_2 represents an alkyl radical of 1 through 4 carbon atoms in the 4-, 5- or 6-position, or R_1 represents cyclopropyl and R_2 represents hydrogen.

4,167,572
N-6-CHLORONICOTINOYL-D,L-HOMOCYSTEINE THIOLACTONE

Paolo DeWitt, and Maria T. Ramacci, both of Rome, Italy, assignors to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A., Italy

Filed Sep. 28, 1977, Ser. No. 837,529
Claims priority, application Italy, Oct. 14, 1976, 51734 A/76
Int. Cl.[2] C07D *213/56;* A61K *31/44*
U.S. Cl. 424—266 3 Claims

1. N-6-chloronicotinoyl-d,l-homocysteine thiolactone having lipolytic activity:



(1)

and its pharmacologically acceptable salts.

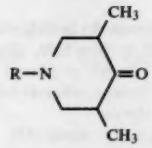
2. A method for reducing elevated free fatty acid and triglyceride plasma levels which comprises the steps of administering to individual exhibiting such elevated levels an effective amount of a composition containing the compound according to claim 1.

4,167,573
METHOD OF CONTROLLING FUNGI WITH 3,5-DIMETHYL-PIPERIDIN-4-ONES

Walter Himmele, Walldorf; Karl-Heinz Koenig, Frankenthal; Norbert Goetz, Worms, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed May 1, 1978, Ser. No. 901,418
Claims priority, application Fed. Rep. of Germany, May 7, 1977, 2720612
Int. Cl.[2] A01N *9/22*
U.S. Cl. 424—267 1 Claim

1. A process for combating fungi, wherein the area to be protected against fungal attack is treated with a fungicidally effective amount of a 3,5-dimethyl-piperidin-4-one derivative of the general formula



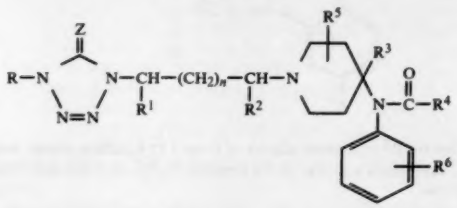
where R is straight-chain or branched alkyl of 8 to 20 carbon atoms or is cycloalkyl, cycloalkylalkyl, alkylcycloalkylalkyl, bicycloalkyl, alkylbicycloalkyl, tricycloalkyl or tetracycloalkyl of 8 to 20 carbon atoms or with a salt of this compound.

4,167,574
N-PHENYL-N-(4-PIPERIDINYL)AMIDES

Frans Janssens, Putte, Belgium, assignor to Janssen Pharmaceutica, N.V., Belgium

Continuation-in-part of Ser. No. 886,188, Mar. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 793,814, May 5, 1977, abandoned. This application Oct. 25, 1978, Ser. No. 954,709
Int. Cl.[2] C07D *401/06;* A61K *31/445*
U.S. Cl. 424—267 14 Claims

1. A chemical compound selected from the group consisting of a N-phenyl-N-(4-piperidinyl)amide derivative having the formula:



and the pharmaceutically acceptable acid addition salts thereof,

wherein:

R is a member selected from the group consisting of hydrogen, lower alkyl, cycloalkyl, having 3 to 6 ring carbon atoms lower alkenyl, lower alkynyl, (lower alkyl)oxy(-lower alkyl), aryl and aryl(lower alkyl);

R^1 is a member selected from the group consisting of hydrogen, lower alkyl and aryl;

R^2 is a member selected from the group consisting of hydrogen and lower alkyl;

R^3 is a member selected from the group consisting of lower alkyloxycarbonyl, lower alkyloxymethyl and lower alkylcarbonyl;

R^4 is a member selected from the group consisting of lower alkyl, cycloalkyl, having 3 to 6 ring carbon atoms lower alkenyl, lower alkyloxy and arylmethyl;

R^5 is a member selected from the group consisting of hydrogen and lower alkyl;

R^6 is a member selected from the group consisting of hydrogen, halo, lower alkyl, lower alkyloxy and trifluoromethyl;

Z is a member selected from the group consisting of O and S; and

n is the integer 0 or 1;

wherein said aryl as used in the foregoing definitions is selected from the group consisting of phenyl, substituted phenyl, thienyl and pyridinyl, said substituted phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, and trifluoromthyl.

12. A pharmaceutical composition comprising an inert car-

rier material and as an active ingredient an effective analgesic amount of a compound selected from the group consisting of methyl 1-[2-(4,5-dihydro-5-oxo-4-propyl-1H-tetrazol-1-yl)ethyl]-4-[(1-oxopropyl)phenylamino]-4-piperidinecarboxylate and the pharmaceutically acceptable acid addition salts thereof.

4,167,575
3-ALKOXYISOTHIAZOLES

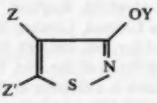
George A. Miller, Glenside, and Sheldon N. Lewis, Willow Grove, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 659,814, Feb. 20, 1976, Pat. No. 4,053,479, which is a division of Ser. No. 855,048, Sep. 3, 1969, Pat. No. 3,957,808. This application Jul. 26, 1977, Ser. No. 819,086

Int. Cl.[2] **C07D** *275/02;* **A61K** *31/420*

U.S. Cl. 424—270 **12 Claims**

1. A compound of the formula



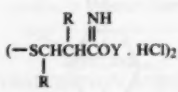
wherein

Y is an alkyl group of 1 to 18 carbon atoms; a cycloalkyl group of 3 to 8 carbon atoms; a benzyl group; a halogen-, (C_1–C_4)alkyl-, or (C_1–C_4)alkoxy-substituted benzyl group; a carbalkoxyalkyl group of up to 12 carbon atoms; a dialkylaminoalkyl group of up to 12 carbon atoms; a haloalkyl group of up to 12 carbon atoms; an alkoxyalkyl group of up to 12 carbon atoms; an alkylthio alkyl group of up to 12 carbon atoms; an alkenyl group of up to 12 carbon atoms; or an alkynyl group of up to 12 carbon atoms;

Z is a nitro group or an amino group;

Z′ is hydrogen, halogen, or a (C_1–C_4)alkyl group; and the salts thereof with a strong acid.

12. A process for preparing a compound according to claim **1** which comprises contacting at least three mole equivalents of a halogenating agent selected from chlorine, bromine, sulfuryl chloride, sulfuryl bromide, N-chlorosuccinimide, N-bromosuccinimide with a disulfideimidate of the formula



wherein R and R′ are hydrogen, halogen, or a (C_1–C_4)alkyl group, and Y is as defined in claim **1** at temperatures from about 0° C. to 60° C. in an inert non-aqueous solvent.

4,167,576
CYANOARALKYLHETEROCYCLIC COMPOUNDS

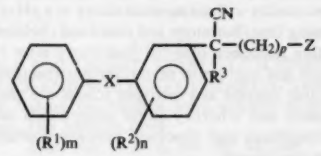
George A. Miller, Maple Glen, and Hak-Foon Chan, Doylestown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 6, 1977, Ser. No. 840,072

Int. Cl.[2] **C07D** *233/60;* **A61K** *31/415*

U.S. Cl. 424—273 R **13 Claims**

1. A compound of the formula



wherein

R^1 and R^2 are independently selected from the group consisting of hydrogen, halogen, (C_1 to C_4) alkyl, (C_1 to C_4) alkoxy, nitro, cyano, trihalomethyl, mono (C_1 to C_4) alkylamino and di (C_1 to C_4) alkylamino;

R^3 is selected from the group consisting of hydrogen, (C_1 to C_{12}) alkyl, (C_3 to C_8) cycloalkyl, (C_2 to C_8) cycloalkenyl, (C_6 to C_{10}) aryl or (C_6 to C_{10}) aryl substituted with up to 3 substituents selected from the group consisting of halogen, (C_1 to C_4) alkyl, (C_1 to C_4) alkoxy, and nitro and (C_7 to C_{11}) aralkyl or C_7 to C_{11}) aralkyl substituted with up to three substituents selected from the group consisting of halogen, (C_1 to C_4) alkyl, (C_1 to C_4) alkoxy, and nitro;

Z is 1-imidazoyl;

X is selected from the group consisting of CH_2, O, S, SO, and SO_2;

m and n are independently zero or the integer 1 or 2;

p is an integer from 1 to 5; and the agronomically acceptable acid addition salts thereof.

13. A method for controlling phytopathogenic fungi which comprises applying to the plant, the plant seed, or the plant habitat, a fungicidally effective amount of a compound according to claim **1**.

4,167,577
ANAPHYLACTIC INHIBITORS

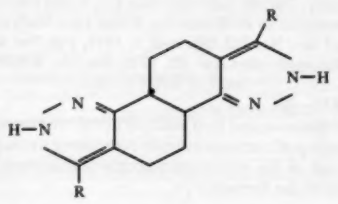
Victor E. Marquez, Caracas, Venezuela, assignor to Laboratorios Cosmos S.A., Caracas, Venezuela

Division of Ser. No. 797,870, May 17, 1977, Pat. No. 4,135,048. This application Mar. 8, 1978, Ser. No. 884,490

Int. Cl.[2] **A61K** *31/415*

U.S. Cl. 424—273 P **2 Claims**

1. A method for the treatment of asthmatic symptoms which comprises orally administering to an animal in need of such treatment an anaphylactic inhibiting effective amount of a compound of the formula



wherein R is H, OH, CN, CO_2Me, CO_2Et, CO_2H, CF_3, halogen, NO_2 or NH_2.

4,167,578
METHOD FOR REMOVING SULFUR AND NITROGEN COMPOUNDS FROM A GAS MIXTURE

Arun K. Mehta, Windsor; Carl R. Bozzuto, Enfield, and Prabhudas P. Kantesaria, Windsor, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 22, 1977, Ser. No. 835,546

Int. Cl.[2] **C01B** *21/00*

U.S. Cl. 423—235 **1 Claim**

1. A process for the removal of sulfur dioxide and nitrogen oxides from gas mixtures including,

(a) contacting a gas mixture containing sulfur dioxide and nitrogen oxides with an aqueous slurry at a pH of 6.0 to 6.5 containing lime/limestone and dissolved chelated iron and providing residence time for said slurry after its contact with said gas mixture to permit further reaction whereby said sulfur dioxide and nitrogen oxides are reacted with said slurry and whereby sulfur compounds are precipitated therefrom and dissolved nitrogen-containing compounds are formed,

(b) continuously bleeding a portion of the reacted slurry at a pH of 4.5 to 6.0 into a first thickening zone,

(c) separating said precipitated sulfur compounds from the slurry liquids in the first thickening zone and decanting the slurry liquids containing the dissolved chelated iron and dissolved nitrogen-containing compounds into an oxidizing zone,

(d) passing air through the decanted liquids in the oxidizing zone until the pH has been lowered to 2.0 to 3.0 in the precipitation of the chelated iron,

(e) separating said precipitated chelated iron from the liquid containing the nitrogen-containing compounds and recycling the chelated iron to the aqueous slurry for contacting the gas mixture,

(f) adding lime to the separated liquids containing the nitrogen-containing compounds to raise the pH and to form ammonia and precipitated sulfur compounds,

(g) separating the precipitated sulfur compounds from the liquid and stripping ammmonia from the liquid.

4,167,579

ANTIBIOTIC X-14547 AND ITS USE FOR INCREASING FEED EFFICIENCY IN RUMINANTS

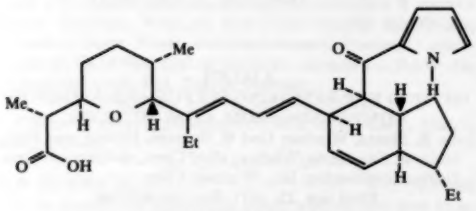
John Westley, Clifton, and Chao-Min Liu, Cedar Grove, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 712,286, Aug. 6, 1976, Pat. No. 4,100,171. This application Apr. 20, 1978, Ser. No. 898,054

Int. Cl.[2] **A61K** *31/40*

U.S. Cl. 424—274 **2 Claims**

2. A ruminant animal feed additive premix for increasing the feed efficiency of ruminant animals comprising a ruminant feed material and, as the active ingredient a sufficient amount of a compound of the formula



or a pharmaceutically acceptable salt thereof, to provide, upon addition of the premix to a conventional ruminant feed, a propionate increasing amount of the active ingredient.

4,167,580

COMPOSITIONS AND METHOD OF USE TO TREAT ARTHRITIC DISEASE WITH M-FLUOROBENZIMIDOYLACETONITRILE

Adolph E. Sloboda, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 853,942, Nov. 22, 1977, Pat. No. 4,134,990, which is a continuation-in-part of Ser. No. 814,604, Jul. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 757,280, Jan. 6, 1977, abandoned, which is a continuation-in-part of Ser. No. 664,470, Mar. 8, 1976, abandoned. This application Sep. 13, 1978, Ser. No. 942,088

Int. Cl.[2] **A61K** *31/275;* **C07C** *121/68*

U.S. Cl. 424—304 **5 Claims**

1. m-Fluorobenzimidoylacetonitrile.

4. The method of meliorating inflammation in a mammal which comprises administering to said mammal an effective amount of m-fluorobenzimidoylacetonitrile.

4,167,581

ALKANOLAMINE DERIVATIVES AND PHARMACEUTICAL COMPOSITIONS AND USES THEREOF

Leslie H. Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

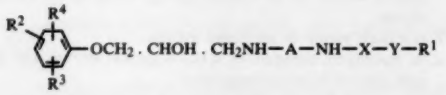
Continuation-in-part of Ser. No. 880,495, Feb. 23, 1978, Pat. No. 4,131,685, which is a division of Ser. No. 738,173, Nov. 2, 1976, Pat. No. 4,083,992, which is a division of Ser. No. 607,995, Aug. 26, 1975, Pat. No. 4,010,189, which is a division of Ser. No. 421,669, Dec. 4, 1973, Pat. No. 3,928,412. This application Nov. 1, 1978, Ser. No. 956,986

Claims priority, application United Kingdom, Dec. 15, 1972, 57970/72

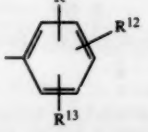
Int. Cl.[2] **A61K** *31/275, 31/165;* **C07C** *121/50, 121/60*

U.S. Cl. 424—304 **14 Claims**

1. A pharmaceutical composition comprising as active ingredient a therapeutically effective amount of at least one alkanolamine selected from compounds of the formula:



wherein A is alkylene of from 2 to 12 carbon atoms, wherein R^1 is hydrogen, or alkyl, halogenoalkyl, alkenyl or cycloalkyl each of up to 10 carbon atoms, or aryl of the formula:



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, alkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms, or aryl, aryloxy or aralkoxy each of up to 12 carbon atoms; or wherein R^2 and R^3 together, and/or R^{12} and R^{13} together, are trimethylene, tetramethylene, 1-oxotetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; wherein R^4 is hydrogen, hydroxy or hydroxymethyl or aralkoxy of up to 12 carbon atoms; wherein R^{14} is hydrogen, amino or dialkylamino of up to 12 carbon atoms; wherein X is carbonyl (—CO—) and wherein Y is a direct link, or alkylene,

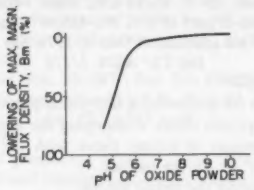
oxyalkylene or alkyleneoxy each of up to 6 carbon atoms, or except when R^1 is hydrogen, oxygen; and the acid-addition salts thereof, in association with a pharmaceutically-acceptable diluent or carrier therefor.

4,167,582

MAGNETIC METALLIC POWDER CONTAINING IRON AND MAGNETIC RECORDING MEDIUM USING SAME POWDER

Noboru Takahashi; Sadao Ozaki; Tunehide Naruse; Hiromasa Isono, and Toshikazu Nishihara, all of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Aug. 26, 1977, Ser. No. 828,034
Claims priority, application Japan, Aug. 27, 1976, 51-101576
Int. Cl.[2] H01F *1/08;* B32B *15/02, 15/18*
U.S. Cl. 428—328 26 Claims



13. A magnetic recording medium comprising a base of a nonmagnetic material and a thin magnetic layer laid on a surface of said base, said magnetic layer being a dispersion of a magnetic metallic powder comprising iron and optionally at least one other ferromagnetic metal in a solidified polymer binder, said magnetic metallic powder having a saturation magnetization at room temperature greater than about 150 emu/g, said metallic powder having been prepared by the reduction of a metal oxide powder whose metal component corresponds to the composition of said metallic powder, the pH of said metal oxide powder being not less than about 6.0, wherein said reduction is performed by heating the metal oxide powder in a reducing gas atmosphere.

21. A method for the production of an oxidation resistant magnetic metallic powder comprising iron and optionally at least one other ferromagnetic metal comprising the steps of preparing a metal oxide powder whose metal component corresponds to the composition of the metallic powder, said metal oxide powder having a pH not less than about 6.0 and reducing said metal oxide powder by heating same in a reducing gas atmosphere until the saturation magnetization of the resultant magnetic metallic powder is greater than about 150 emu/g.

4,167,583

MICROBIAL COMPOSITION AND FORMULATIONS

Therese Knott, Wuppertal; Karlheinz Adams, Cologne, and Erich Klauke, Odenthal-Hahnenberg, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 605,723, Aug. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 485,299, Jul. 2, 1974, abandoned. This application Dec. 12, 1977, Ser. No. 859,698
Claims priority, application Fed. Rep. of Germany, Jul. 3, 1973, 2333849
Int. Cl.[2] A61K *31/045, 31/14*
U.S. Cl. 424—343 16 Claims

1. A microbicidal composition consisting of an aqueous solution of from 0.1 to 1% by weight of said composition of at least one dichlorobenzyl alcohol selected from the group consisting of 2,3-dichlorobenzyl alcohol, 2,4-dichlorobenzyl alcohol, 3,4-dichlorobenzyl alcohol and 2,6-dichlorobenzyl alcohol in combination with from 65 to 75% by weight of said composition of at least one propanol selected from the group consisting of n-propanol and isopropanol.

4,167,584

STABLE EMULSIFIED EDIBLE LIQUID STARCH PRODUCT AND METHOD OF MAKING THE SAME

Rolland W. Nelson, Des Moines, Iowa, assignor to Kemin Industries, Inc., Des Moines, Iowa

Filed Jan. 9, 1978, Ser. No. 867,809
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—2 18 Claims

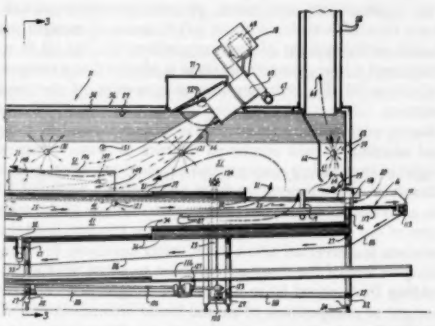
1. An animal feed, which consists essentially of from about 90% to about 95% of dry feed material, and from about 5% to about 10% on a dry weight basis of a stable emulsified liquid starch product that is substantially free of non-protein nitrogen additives which comprises from about 45% to about 85% by weight edible liquid, and from about 15% to about 55% by weight of a whole starch bearing material emulsified with said edible liquid and from about $\frac{1}{4}$ to about 1% of a preservative mixture for mold prevention to provide an emulsion which is stable for at least 3 to 6 months and yet which is still conveniently pourable, said starch bearing material being cooked, gelatinized and at least partially enzymatically hydrolyzed the predominant proportior of the particles of said emulsion not exceeding an average particle diameter of 300 microns.

4,167,585

METHOD FOR HEATING AND COOKING FOODS IN A CLOSED TREATMENT CHAMBER BY MAINTAINING THE TEMPERATURE AND MOISTURE CONTENT

Andrew A. Caridis, Foster City, and Clark K. Benson, Millbrae, both of Calif., assignors to Heat and Control, Inc., San Francisco, Calif.

Continuation of Ser. No. 662,512, Mar. 1, 1976, abandoned, which is a continuation-in-part of Ser. No. 544,393, Jan. 27, 1975, Pat. No. 3,947,241, which is a continuation of Ser. No. 328,925, Feb. 2, 1973, abandoned. This application Nov. 21, 1977, Ser. No. 853,503
Int. Cl.[2] A22C *17/00, 25/00;* F27B *9/00, 9/14*
U.S. Cl. 426—233 13 Claims



1. In a rapid continuous process for heating and cooking foods, the steps of forming a treating zone within a substantially closed treatment chamber, said chamber having inlet and outlet openings, introducing food to said chamber in the form of solid discrete pieces, said food moving through said chamber along a pathway extending through said inlet opening and said treating zone and exiting through said outlet opening, generating a gaseous process vapor within said treatment chamber and rapidly and continuously circulating the same along the pathway in said treating zone in a direction concurrent to the direction of movement of said food, heating said rapidly circulating process vapor to continuously maintain the temperature thereof within the range from 165° to 600° F., the temperature of said rapidly circulating process vapor bearing a

relationship to the entering food such that a substantial temperature differential exists between the food and process vapor ranging to as much as 295° to 560° F., said food being moved in a concurrent direction with said rapidly circulating process vapor at a rate and for a distance to effect heating and cooking thereof for a period of time sufficient to raise the center temperature of said discrete pieces of food to within the range from 140° to 195° F., intermittently releasing saturated steam into said rapidly circulating and heated process vapor to raise the moisture content thereof continuously removing external air from adjacent the inlet and outlet openings of said treating chamber to thereby substantially prevent the entry of external air to said treating zone, such exclusion of air serving to limit the proportion of air within the process vapor continuously and rapidly circulating within said treatment chamber and through said treating zone, continuously monitoring the moisture content of said rapidly circulating process vapor to determine variations in the moisture content and continuously using the variations in moisture content so determined to control said intermittent release of saturated steam to the process vapor being rapidly circulated within said treatment chamber, thereby to provide a rapidly and continuously circulating process vapor of controlled temperature and moisture content as needed and desired for heating and cooking particular foods undergoing treatment.

4,167,586

PROCESS FOR PREPARING BLOOD ALBUMIN PRODUCT AND THE RESULTING PRODUCT

Juan Heine; Rudolfo Trama, and Eduardo Penedo, all of Espara 146 0, Adrogué, Argentina

Continuation-in-part of Ser. No. 737,336, Nov. 1, 1976, abandoned. This application Oct. 27, 1977, Ser. No. 845,939

Claims priority, application Argentina, Nov. 28, 1975, 261412

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—250 **9 Claims**

1. A process for the manufacturing of a composition for use as human food with high protein value and simulating a liquidous whole egg material, comprising the following steps: mixing adequately with stirring a first emulsifier selected from the group consisting of mono and diglycerides, acetylated and lactylated mono and diglycerides, propylene glycol monostearate, sorbitol fatty acid esters, glycerol monostearate and mixtures thereof with from about 4.0 to about 17 weight percent based on the weight of the composition of a fat oil in a fluid state until a homogeneous mixture is obtained at a temperature of about 70° C.; reducing the temperature of the resultant mixture, while continuing the stirring, to about 40° C.; adding thereto with continuous stirring lecithin followed by the gradual addition to said combined mixture of water containing a sugar in sweetening amounts and a preserving agent previously dissolved at a temperature from about 60° C. to about 70° C., so as to obtain a slow but progressive increase in the temperature of the whole mixture, always under stirring, until the said mixture is converted into a fat in water emulsion; lowering the temperature of the resultant emulsion to about 40° C. and then adding from about 50 to about 86.8 weight percent based on weight of composition of animal blood albumin in two stages: in the first stage not more than about 20 weight percent of albumin being added in a slow manner at a rate sufficient to maintain said emulsion, and in the second stage the rest of the albumin being added rapidly; subjecting said emulsion to an homogenization step at a temperature from about 40° C. to about 50° C., until microcrystals of fatty material of size of about two or three microns are obtained, and reducing the temperature to about 25° C. and reforming the emulsion and cooling said emulsion immediately to a temperature not higher than about 10° C.; and finally storing the emulsion at a temperature of −5° C. or less, the total percent by weight of said emulsifying agents being in the range of about 4 to about 14 weight percent of the composition and the total percent by weight of water being 5 to 35 weight percent of the composition.

4,167,587

COMPOSITIONS AND PROCESS FOR COLORED LIQUID FOOD OR DRINK

Richard C. Danforth, 6808 Algon Ave., Philadelphia, Pa. 19111

Filed Jun. 22, 1977, Ser. No. 808,731

Int. Cl.[2] A23L *2/00*

U.S. Cl. 426—250 **6 Claims**

1. A purple-colored-grape-flavored liquid food or beverage having a coloration between red and blue and having a pH under 4.2, comprising water, an edible soluble or dispersible protein, erythrosine, and a potable liquid purple-colored-grape-flavored beverage base, said protein being stained by said erythrosine and dispersed throughout said liquid food or beverage.

4,167,588

PREPARATION OF FABRICATED BAKED POTATO PRODUCT

Miles J. Willard, 229 N. Lloyd Cir., Idaho Falls, Id. 83401

Continuation-in-part of Ser. No. 459,467, Apr. 10, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 729,480

Int. Cl.[2] A23L *1/216*

U.S. Cl. 426—283 **16 Claims**

1. A process for preparing a fabricated potato product containing baked potato solids, comprising the steps of:

(a) baking pieces of potato tissue with the potato insides exposed to air during baking;

(b) comminuting the baked pieces;

(c) forming an essentially potato-based dough from the comminuted baked potato pieces;

(d) preparing cooked potato mash; and

(e) forming an outer layer of the dough around a core of the cooked potato mash to form an intermediate fabricated potato product in which the core is sealed inside the outer layer of dough.

4,167,589

METHOD FOR THE MANUFACTURE OF CAFFEINE FREE BLACK TEA

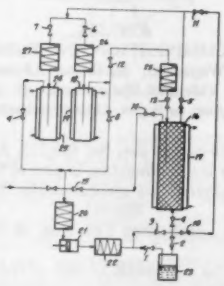
Otto Vitzthum, Bremen, and Peter Hubert, Bremen-Lesum, both of Fed. Rep. of Germany

Continuation of Ser. No. 646,779, Jan. 6, 1976, abandoned, which is a continuation of Ser. No. 461,056, Apr. 15, 1974, abandoned, which is a continuation of Ser. No. 258,508, Jun. 1, 1972, abandoned. This application Apr. 26, 1977, Ser. No. 791,097

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1972, 2127642

Int. Cl.[2] A23F *3/00*

U.S. Cl. 426—312 **19 Claims**



1. A process for the production of caffeine free black tea which comprises the steps of:

a. Extracting tea leaves with a dry extraction solvent gas having selective dissolving capacity for the aromatic component, and which is maintained in the supercritical

state with respect to temperature and presure to extract the aromatic content of the tea and leave a tea residue,

b. Separating the aromatic content from the extraction solvent,

c. Extracting the tea residue with a moist extraction solvent gas having selective dissolving capacity for the caffeine, and which is supercritical with respect to temperature and pressure to remove the caffeine,

d. Redissolving the aromatics separated in Step (b) utilizing an extraction solvent gas which is supercritical with respect to temperature and pressure and separating the aromatics from the gas in the presence of the substantially caffeine free tea residue, thereby to impregnate the residue with the original aromatic content.

4,167,590

METHOD FOR PRODUCING PROTEIN JELLIES FROM FISHES AND CRUSTACEANS

Sergei V. Rogozhin, ulitsa Vavilova, 55/5, kv. 20; Efim S. Vainerman, ulitsa Profsojuznaya, 94/20, kv. 53, and Ljubov M. Burmistrova, ulitsa Preobrazhensky val, 16, kv. 44, all of Moscow, U.S.S.R.

Filed Nov. 23, 1977, Ser. No. 854,236

Claims priority, application U.S.S.R., Nov. 23, 1976, 2423838

Int. Cl.[2] A23J *1/04*

U.S. Cl. 426—574 **5 Claims**

1. Method of producing protein jellies from myofibrillar protein of fishes and crustaceans, which consisting essentially of freezing an aqueous suspension of the myofibrillar protein of fishes or crustaceans, said aqueous suspension containing 5 to 50% by weight of said protein, and then defrosting the thus formed frozen suspension, thereby obtaining a shape-retaining jelly of said myofibrillar protein and water.

4,167,591

PROCESS FOR TEXTURIZING PROTEINS BY COAGULATION WITH SOLVENTS

Cavit Akin, Warrenville, Ill., and Franklin D. Darrington, Munster, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 3, 1977, Ser. No. 821,350

Int. Cl.[2] A23J *3/00*

U.S. Cl. 426—656 **16 Claims**

1. A process for texturing a whole cell single-cell protein material which contains at least 15 percent protein comprising:

(a) mixing a slurry of said single-cell protein material with a solvent-coagulable proteinaceous texturizing agent at a weight ratio of the single-cell material to the texturizing agent of from about 9:1 to about 1:1;

(b) adding an alcohol coagulating solvent to the mixture in sufficient quantity to coagulate the mixture while whipping the mixture to produce a microporous texture thereto during coagulation; and

(c) thermally fixing the texture by heat treating the coagulated mixture at a temperature of from about 80° to about 250° C.

4,167,592

METHOD OF MARKING A LINE ALONG A ROADWAY

Lorne G. Gabel; Garry E. Paulson, and Thomas G. Kirk, all of Saskatoon, Canada, assignors to Her Majesty the Queen in Right of the Province of Saskatchewan, Regina, Canada

Filed Jun. 1, 1977, Ser. No. 802,502

Int. Cl.[2] B05C *1/16;* **E01C** *5/00*

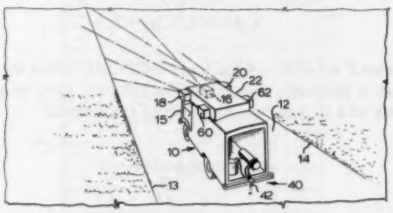
U.S. Cl. 427—137 **8 Claims**

1. A method of marking a line along a roadway using a vehicle carrying paint-marking apparatus, comprising the steps of:

continuously monitoring, by means of a first pair of television cameras mounted on the vehicle one on each side thereof, the edges of the roadway forwardly of the vehicle as the vehicle moves forwardly on a straight roadway;

continuously monitoring, by means of a second pair of television cameras mounted on the vehicle rearwardly of said first pair of cameras one on each side of the vehicle, the edges of the roadway adjacent the vehicle as a vehicle moves forwardly on a curved roadway;

arranging the images of the edges of the roadway, selectively, from said first pair of cameras or said second pair of cameras, in a predetermined relationship on a television



screen when the vehicle is in a predetermined location with respect to the edges of the roadway and maintaining said images in said predetermined relationship on the screen while marking the roadway, the images of the edges of the roadway being oriented to converge; and

marking the roadway rearwardly of the vehicle where the roadway is straight and forwardly of the vehicle where the roadway is curved.

4,167,593

METHOD OF SUBBING A POLYESTER BASE

Geoffrey M. Dodwell, Hutton, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed May 6, 1977, Ser. No. 794,573

Claims priority, application United Kingdom, Jun. 4, 1976, 23120/76; Sep. 28, 1976, 40097/76

Int. Cl.[2] G03C *1/78, 1/96*

U.S. Cl. 427—171 **10 Claims**

1. A method of preparing a subbed film base support material consisting of biaxially oriented synthetic linear polyester of highly hydrophobic character which comprises coating on to the linear polyester base which is receptive to a coating, an aqueous latex or an organic solvent solution of a coating composition consisting essentially of

(a) a copolymer of (1) vinylidene chloride, (2) at least one plasticising comonomer selected from the group consisting of acrylonitrile, alkyl acrylates or methacrylates and (3) optionally other comonomers and

(b) in an amount of 1.5 to 25% by weight of the copolymer (a)

a compound containing an active methylene group of the formulae

$RCOCH_2CN$,

$RCOCH_2COR^1$,

$RCOCH_2CH_2COR^1$ or

$$RCOCHCOR^1$$
$$|$$
$$CH_3$$

wherein R and R^1 are each hydrogen, hydroxy or alkyl, hydroxyalkyl or alkenyl of up to 5 carbon atoms or of the formula

$$CH_2{=}CHCCH_2{-}Q$$
$$\|$$
$$O$$

wherein Q is —CN or

$$-OCCH_3,$$

or of the formula

$$CH_2=CHOCH_2-Z,$$

wherein Z is —CN, —$COCH_3$ or —COC_6H_5 where the phenyl group is optionally substituted by halogen, nitro or alkyl or alkoxy of 1 to 5 carbon atoms, or of the formula

$$CH_2=\underset{R_{14}}{C}CH_2X\overset{O}{C}CH_2-W$$

wherein W is —CN or —$COCH_3$, X is O, NH or S and R_{14} is hydrogen or methyl, drying the coated layer and then completing the orientation if it has not been fully oriented.

4,167,594

COMBINED LAUNDRY FINISHING TREATMENT AGENT PACKAGE AND METHOD

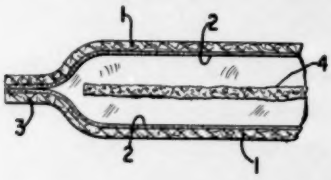
Karl Schwadtke, Leverkusen; Werner Künzel, Langenfeld; Rudolf Weber, Dusseldorf; Rolf Puchta, Haan; Alexander Cioc, Dusseldorf, and Michael Kik, Langenfeld, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien(Henkel KGaA), Dusseldorf, Fed. Rep. of Germany

Filed Dec. 27, 1977, Ser. No. 864,460

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1976, 2658989

Int. Cl.[2] B05D *3/12*

U.S. Cl. 427—242 **22 Claims**



1. A laundry finishing treatment article for use in a mechanical laundry drier to treat fabrics with a substance of the laundry finishing type and a laundry odorant, said article comprising a hollow bag of two-layer composite sheeting having a pillowlike form closed on all sides, the external layer of said two-layer composite sheeting being an open-celled, absorbent layer containing an amount effective to treat said fabrics of said substance, which substance is substantially solid at room temperature and softened or liquefied at elevated drier temperatures to enable transfer of said substance to the laundry during the drying thereof, and the internal layer of the two-layer composite sheeting being a plastic film substantially gas-impermeable at room temperature and gas-permeable to said odorant at elevated drier temperatures, said film enclosing an effective amount of said odorant.

4,167,595

METHOD OF PRINTING ON PLASTIC FOIL

Victor Peters, Windach-Schoeffelding, and Franz Krammer, Friedberg, both of Fed. Rep. of Germany, assignors to Alkor Gesellschaft mit beschränkter Haftung Kunststoffverkauf, Munich-Solln, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 644,527, Dec. 29, 1975, Pat. No. 4,104,219. This application Jun. 19, 1978, Ser. No. 916,509

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1975, 2500500

Int. Cl.[2] B41M *1/10*; C09D *11/10*

U.S. Cl. 427—256 **8 Claims**

1. A method of printing on a body of synthetic resin composition which comprises depositing on said body an imprint of an ink consisting essentially of a dispersion of a pigment in a vehicle, said vehicle consisting essentially of 54% to 67% of an alcohol miscible with water, 20% to 31% water, 10% to 14% polyacrylic acid ester, a polymethacrylic acid ester in an amount of 3 to 25 percent of the weight of said polyacrylic acid ester, said esters being dispersed in a homogeneous mixture of said alcohol and said water, the alcohol moieties of said esters being alkyl or cycloalkyl having 1 to 8 carbon atoms, and an amount of a volatile alkalinizing agent sufficient to make the ink slightly alkaline, the synthetic resin in said body of synthetic resin composition being a member of the group consisting of polyolefin, polyester, polyamide, polycarbonate, polyacrylate, polystyrene, acrylonitrile-butadiene-styrene copolymer, ethylene-vinyl-acetate copolymer, and polymers consisting predominantly of repeating units of vinyl chloride.

2. A method as set forth in claim **1**, wherein said ink is deposited on said body by rotogravure printing.

4,167,596

METHOD OF PREPARATION AND USE OF ELECTROLESS PLATING CATALYSTS

Nathan Feldstein, c/o Surface Technology, Inc., P.O. Box 2027, Princeton, N.J. 08540

Division of Ser. No. 820,904, Aug. 1, 1977, Pat. No. 4,131,699, and a continuation-in-part of Ser. No. 625,326, Oct. 23, 1975, Pat. No. 4,048,354. This application Apr. 5, 1978, Ser. No. 893,248

Int. Cl.[2] C23C *3/02*

U.S. Cl. 427—306 **13 Claims**

1. An improved process for the preparation of non-conductor substrates prior to electroless plating comprising the steps of:

1. contacting said substrate with a catalytic composition comprising a non-precious catalytic metal capable of electroless plating initiation, and
2. contacting the treated substrate with a reducing composition comprising a reducing agent and a deactivator capable of deactivating contamination derived from the catalytic composition thereby preventing undesired bulk decomposition of the reducing composition and further whenever said catalytic composition is of a colloidal nature said deactivator is a colloid stabilizer capable of encapsulating the colloid present in said catalytic composition and further whenever said catalytic composition is a solution, said deactivator is a chelating agent capable of complexing metal ions.

4,167,597

PROCESS FOR EXTENDING THE LIFE OF AN ANTIFOULING PAINT FILM

Morio Yoshida, Kawanishi; Ikuo Asato, Osaka; Toru Semba, Hirakata, and Kiyoshi Murase, Amagasaki, all of Japan, assignors to Toa Paint Company, Ltd., Osaka, Japan

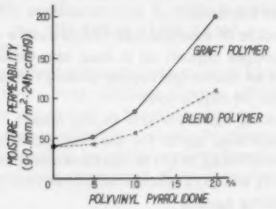
Continuation-in-part of Ser. No. 780,426, Mar. 23, 1977, abandoned. This application Apr. 28, 1978, Ser. No. 900,778

Int. Cl.[2] B05D *1/36*

U.S. Cl. 427—407 B **4 Claims**

1. A process for extending the life of an anti-fouling paint

film which comprises applying onto an anti-fouling paint film a composition to form a protective coating consisting essentially of a graft polymer having a graft efficiency of more than 30% by weight prepared by polymerizing at least one vinyl monomer slected from the group consisting of methacrylic acid esters, acrylic acid esters, acrylonitrile, styrene, α-methyl



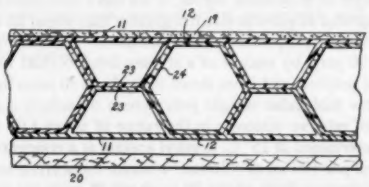
styrene and vinyl acetate in the presence of a hydrophilic polymer selected from the group consisting of polyvinyl alcohol, polyethylene glycol, polypropylene glycol, polyvinyl pyrrolidone and their derivatives, said protective coating having a moisture permeability of 45 to 480 g.0.1 mm/m².24 hr.cmHg.

4,167,598

HEAT AND SOUND INSULATING PANEL

Paul A. Logan, 3404 Middlesex Dr., Apt. E, Toledo, Ohio 43606; Robert C. Olivero, 123 Saunders St., Dalzell, Ill. 61320; William C. Olivero, 123 Saunders St., Dalzell, Ill. 61320, and Carlo Olivero, 123 Saunder St., Dalzell, Ill. 61320

Filed May 24, 1977, Ser. No. 799,978
Int. Cl.² B32B *1/08, 3/30*
U.S. Cl. 428—35 **8 Claims**



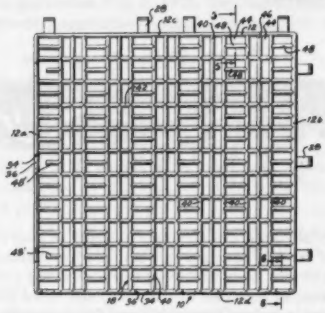
1. An insulating structural wall supporting panel assembly comprising a pair of vertical panel elements of heat insulating material each having a main plate-like body portion formed with a plurality of spaced, hollow, elongated, sealed vertical chambers projecting from the plane of the main body portion and extending continuously for the full height of the assembly parallel to said body portion and to one another, said elongated sealed chambers being evacuated, and means interlockingly joining said panel elements, with said body portions in spaced parallel relationship, with said vertical evacuated chambers extending inwardly from said body portions, and with the evacuated chambers of the respective panel elements extending parallel and in surface abutment with each other, and wherein the elongated vertical evacuated chamber have inner face portions and wherein the inner face portions of the elongated vertical evacuated chambers of the respective panel elements are in surface abutting contact, and wherein said interlockingly joining means comprises vertical column-defining filler members of insulating material conformably interfitting with the spaces between the successive abutting inner face portions of the vertical elongated chambers.

4,167,599

MAT AND UNITS THEREOF

Esko Nissinen, Kaskenkatu 11 D 91, 20700 Turku 70, Finland

Filed Aug. 16, 1977, Ser. No. 825,187
Int. Cl.² B32B *3/10, 3/06*
U.S. Cl. 428—44 **12 Claims**



1. A mat comprising a plurality of identical one-piece units adapted to be situated next to each other and interconnected for forming a continuous mat structure, each of said units being formed of plastic material having a continuous peripheral flange defined by a first pair of straight, parallel, opposed flange sides and a second pair of straight, opposed parallel flange sides extending transversely between said first pair of flange sides, said flange having upper and lower edges and an open network of intersecting ribs surrounded by and integral with said flange and situated at least in part between the upper and lower edges of said flange while being spaced upwardly from said lower edge of said flange, said open network of intersecting ribs including a first set of substantially equally spaced ribs extending between said second pair of flange sides parallel to said first pair of flange sides and a second set of substantially equally spaced ribs extending between said first pair of flange sides parallel to said second pair of flange sides, said first and second sets of ribs being integrally formed with and intersecting each other defining a plurality of adjacent rows of square spaces, a first set of alternate rows of spaces including elongate additional ribs extending parallel to said first pair of flange sides, substantially bisecting each of said square spaces in said first set of alternate rows and a second set of alternate rows of spaces including elongate additional ribs extending parallel to said second pair of flange sides substantially bisecting each of said square spaces in said second set of alternate rows, each unit having a plurality of short feet integral with and distributed along said flange and extending downwardly from said lower edge thereof and a plurality of long feet longer than said short feet and being integral with said open network of intersecting ribs and extending downwardly therefrom, all of said feet terminating in lower ends situated in a common plane parallel to and lower than a plane which includes said lower edge of said flange, at least one pair of flange sides comprising a pair of elongated opposed connecting regions one of which carries a plurality of integral fastener projections extending outwardly from said one flange region and each formed with a recess which is directed downwardly and formed with a lower open end, the other of said pair of flange regions being formed with notches for respectively receiving the fastener projections of an adjoining unit with said other flange region having at said notches flange portions the size and configuration of which enables them to be situated in said recesses of the fastener projections of an adjoining unit and wherein some of said ribs extend perpendicularly with respect to said other flange region respectively in line with but terminating short of said notches thereof to provide spaces for receiving said fastener projections of an adjoining unit.

4,167,600
SUPERFICIALLY DYED FABRICS

José Benzaquén, Caseros, Argentina, assignor to Benzaquen, Sociedad Anonima, Industrial et al., Argentina

Division of Ser. No. 311,261, Dec. 1, 1972, Pat. No. 3,872,557.
This application Feb. 5, 1975, Ser. No. 547,179
Int. Cl.[2] B32B *33/00*
U.S. Cl. 428—91 8 Claims

1. A textile fabric comprising a plurality of interwoven warp and woof threads having a substantially low number count, at least one of said warp and woof threads having a substantially high torsion, at least one of said warp and woof threads being dyed a predetermined base color, and fibrils superficially raised on the surface of at least one side of said fabric and intermingled with each other to provide a plushed surface and a change in tonality of said surface from said predetermined base color.

4,167,601
METHOD OF DEPOSITING A STRESS-FREE ELECTROLESS COPPER DEPOSIT

William M. Beckenbaugh, East Amwell Township, Hunterdon County, and Kim L. Morton, Delaware Township, Hunterdon County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 741,639, Nov. 15, 1976, abandoned. This application Nov. 2, 1978, Ser. No. 956,946
Int. Cl.[2] B32B *3/10;* C23C *3/02*
U.S. Cl. 428—209 45 Claims

1. A method of depositing a stress-free copper deposit on a surface which comprises contacting a catalyzed surface with a solution comprising:
(a) a source of cupric ions;
(b) a reducing agent for said cupric ions;
(c) a complexing agent for the solution selected from the group consisting of (1) an ethyleneamine acetic acid compound, (2) a salt of (1), and (3) a mixture of at least two of the foregoing complexing agents;
(d) a stabilizer for the solution comprising a mercury compound; and
(e) an accelerator for the solution comprising a water-soluble compound containing a cyanide radical complexed with a metal selected from Group VIII of the Periodic Table of the Elements.

14. A method of rendering an electroless copper deposition solution capable of having deposited therefrom a stress-free copper deposit which comprises combining in the solution:
(a) a complexing agent for the solution selected from the group consisting of (1) an ethyleneamine acetic acid, (2) a salt of (1), and (3) a mixture of at least two of the foregoing complexing agents;
(b) a stabilizer for the solution comprising a mercury compound; and
(c) an accelerator for the solution comprising a water-soluble compound containing a cyanide radical complexed with a metal selected from the Group VIII of the Periodic Table of the Elements.

18. An aqueous electroless plating solution capable of depositing therefrom an essentially stress free copper deposit comprising:
(a) a source of cupric ions;
(b) a reducing agent for said cupric ions;
(c) a complexing agent for the solution selected from the group consisting of (1) an ethyleneamine acetic acid, (2) a salt of (1), and (3) a mixture of at least two of the foregoing complexing agents;
(d) stabilizer for the solution comprising a mercury compound; and
(e) an accelerator for the solution comprising a water-soluble compound containing a cyanide radical complexed with a metal selected from Group VIII of the Periodic Table of Elements.

32. An article of manufacture comprising a substrate and a stress-free copper deposit on at least one surface thereof, deposited from an electroless copper plating solution comprising:
(a) a source of cupric ions;
(b) a reducing agent for said cupric ions;
(c) a complexing agent for the solution selected from the group consisting of (1) an ethyleneamine acetic acid, (2) a salt of (1), and (3) a mixture of at least two of the foregoing complexing agents;
(d) a stabilizer for the solution comprising a mercury compound; and
(e) an accelerator for the solution comprising a water-soluble compound containing a cyanide radical complexed with a metal selected from Group VIII of the Periodic Table of Elements.

4,167,602
ELECTROGRAPHIC RECORDING MATERIAL

Irving Serlin, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 26, 1978, Ser. No. 909,873
Int. Cl.[2] B32B *5/16;* C08L *25/06;* B32B *27/10*
U.S. Cl. 428—240 11 Claims

1. An electrographic recording material comprising a conductive sheet support coated on at least one side with an electrically insulating layer comprising an intimate blend of a polymeric binder and up to 500 parts by weight per 100 parts by weight of polymeric binder, of an inert, non-photoconductive pigment of particle size not greater than about 20 microns, wherein the polymeric binder comprises from about 50 to about 90 parts by weight of a styrene interpolymer or a vinyl acetate polymer and from about 10 to about 50 parts by weight of a low molecular weight polystyrene or poly(α-methylstyrene) of relative viscosity in the range of about 1.04 to about 1.15 determined at 25° C. in ethyl acetate at a concentration of 2 grams per 100 ml of solution, wherein the styrene interpolymer comprises from about 30 to about 75 parts by weight of styrene, from about 69 to about 15 parts by weight of a monomer selected from the group consisting of alkyl acrylates and methacrylates containing from 4 to 15 carbon atoms and dialkyl maleates and fumarates containing from 6 to 28 carbon atoms and from about 1 to about 10 parts by weight of an unsaturated carboxylic acid monomer selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid, and monoalkyl maleates and fumarates containing from 5 to 8 carbon atoms and wherein the vinyl acetate polymer is selected from the group consisting of polyvinyl acetate and interpolymers of vinyl acetate comprising from about 60 to about 90 parts by weight of vinyl acetate, from about 9 to about 30 parts by weight of a monomer selected from the group consisting of alkyl acrylates containing from 4 to 7 carbon atoms, dialkyl maleates and fumarates containing from 6 to 12 carbon atoms, and vinyl esters of monocarboxylic acids containing from 5 to 20 carbon atoms, and from about 1 to 10 parts by weight of an unsaturated carboxylic acid monomer selected from the group consisting of acrylic acid, methacrylic acid, crotonic acid and monoalkyl maleates and fumarates containing from 5 to 8 carbon atoms.

4,167,603

FLAME RESISTANT COTTON/POLYESTER BLEND SUBSTRATES

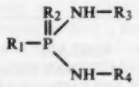
Thomas O. Sistrunk, Southfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 750,231, Dec. 13, 1976, which is a continuation-in-part of Ser. No. 571,738, Apr. 25, 1975, Pat. No. 3,997,699. This application Sep. 5, 1978, Ser. No. 939,283

Int. Cl.[2] D06M *13/10, 13/44*

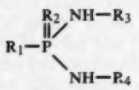
U.S. Cl. 428—260 34 Claims

1. A flame retardant substrate comprising a blend of cotton and polyester fibers, said substrate having affixed thereto a flame retardant amount of a bromine-containing compound selected from tetramethyl[(2,3,5,6-tetrabromo-p-phenylene)-dimethylene]diphosphite and decabromobiphenyl oxide; and a phosphorus-containing compound of the formula



in which R_1 is methyl, ethyl, propyl or phenyl; R_2 is oxygen or sulfur; R_3 is hydrogen, methyl, ethyl or propyl; and R_4 is hydrogen, methyl, ethyl or propyl.

18. A method for increasing the flame resistance of a substrate composed of a blend of cotton and polyester fibers comprising treating said substrate with an aqueous solution or suspension of a bromine-containing compound selected from tetramethyl[(2,3,5,6-tetrabromo-p-phenylene)-dimethylene]-diphosphite and decabromobiphenyl oxide; and a phosphorus-containing compound of the formula



in which R_1 is methyl, ethyl, propyl or phenyl; R_2 is oxygen or sulfur; R_3 is hydrogen, methyl, ethyl or propyl; and R_4 is hydrogen, methyl, ethyl or propyl; drying the substrate and curing the substrate.

4,167,604

THERMAL INSULATION MATERIAL COMPRISING A MIXTURE OF DOWN AND SYNTHETIC FIBER STAPLE

William E. Aldrich, Ashaway, R.I., assignor to Warnaco Inc., Bridgeport, Conn.

Filed Jun. 30, 1978, Ser. No. 920,706

Int. Cl.[2] A47G *9/00, 9/08*

U.S. Cl. 428—359 9 Claims

1. A thermal insulation material comprising a batting, said batting being formed from a carded web containing at least 10 wt.% natural down and a synthetic fiber staple, said synthetic fiber staple being formed from crimped, hollow polyester fibers.

2. The material of claim 1, further including a thermosetting resin being uniformly dispersed therein.

4,167,605

ARTICLE WITH ANTISTICK COATING AND COMPOSITION

Terence E. Attwood, Kimpton, and Ronald P. Buckley, Stevenage, both of England, assignors to Imperial Chemical Industries Limited, London, England

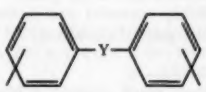
Division of Ser. No. 707,766, Jul. 22, 1976, Pat. No. 4,090,993. This application Feb. 6, 1978, Ser. No. 875,545

Claims priority, application United Kingdom, Jul. 29, 1975, 31709/75

Int. Cl.[2] B32B *27/06*

U.S. Cl. 428—419 6 Claims

1. A coated article having an adherent coating formed from a dispersion comprising a tetrafluoroethylene polymer selected from tetrafluoroethylene homopolymers, telomers, or copolymers with up to 5% by weight of a comonomer, selected from the group consisting of ethylene, vinyl chloride, hexafluoropropene and perfluoropropyl perfluorovinyl ether, said tetrafluoroethylene polymer having an average particle size of less than 20 μm, dispersed in an inert diluent, said diluent having a thermoplastic aromatic polyethersulphone of reduced viscosity below 0.25 (as measured at 25° C. on a solution of the polymer in dimethyl formamide containing 1 g of polymer in 100 cm^3 of solution) dissolved or dispersed as particles of size below 25 μm (as measured by a Micromerograph) therein, or the precursor to such a polyethersulphone, said thermoplastic aromatic polyethersulphone having repeat units of the general formula —Ar—SO_2— in which Ar is a divalent aromatic radical, at least some of the —Ar— units having the structure



in which Y is oxygen or the divalent radical obtained by removal of the hydrogen atoms from the —OH groups of an aromatic diol and in which 0 to 50% of the —SO_2— groups are replaced by —CO— groups, said dispersion having a tetrafluoroethylene polymer/polyethersulphone (or precursor thereto) weight ratio between 4:1 and 1:3.

4,167,606

MULTIPLE MEMBER CLAD METAL PRODUCTS

John B. Ulam, McMurray, Pa., assignor to Clad Metals, Inc., Canonsburg, Pa.

Continuation-in-part of Ser. No. 744,043, Jan. 22, 1976, Pat. No. 4,103,076, which is a continuation-in-part of Ser. No. 572,732, Apr. 29, 1975, Pat. No. 4,004,892, which is a division of Ser. No. 423,253, Dec. 10, 1973, Pat. No. 3,952,938. This application Jan. 6, 1978, Ser. No. 867,576

The portion of the term of this patent subsequent to Jan. 25, 1993, has been disclaimed.

Int. Cl.[2] B32B *15/18, 15/20*

U.S. Cl. 428—653 4 Claims

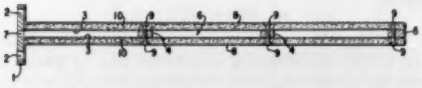
1. A clad metal product consisting essentially of a core having a member from the group consisting of copper and copper alloys; and at least one layer of aluminum alloy containing less than 99% aluminum coated with substantially pure aluminum containing at least 99% aluminum, said core forming a major thickness portion of said composite and at least one outer cladding layer of stainless steel bonded to said aluminum opposite the copper so that the aluminum layers lie between the stainless steel and the copper with substantially pure aluminum abutting the copper.

4,167,607

HALOGEN ELECTRODES AND STORAGE BATTERIES

Vittorio de Nora, Nassau, The Bahamas, and Placido M. Spaziante, Lugano, Switzerland, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Filed Dec. 19, 1977, Ser. No. 861,951
Int. Cl.[2] H01M 8/04
U.S. Cl. 429—15 41 Claims



1. A composite halogen electrode for rechargeable metal-halogen energy atorage cells having facing halogen and metal electrodes, comprising at least two layers including a first layer and a second layer in electrical contact with each other over substantially the entire electrode surface, the first layer being comprised of a thin, foraminous sheet of non-corrodible electrically-conductive valve metal of which at least the exposed outer surface is coated with a non-passivating and electrocatalytically active material, and the second layer being a porous fluid-permeable body of material selected from the group consisting of carbon, sintered valve metals and sintered valve metal carbides, borides and silicides having a coated non-passivating and electrocatalytic active surface extending throughout its porous structure forming a three-dimensional percolating electrode, said exposed outer surface of the first layer operatively facing an opposing metal electrode of the cell and said second layer being disposed behind the plane of the first layer whereby it is effectively screened and protected from anodic processes during charging of the battery.

4,167,608

ADDITIVE FOR LITHIUM ANODE, THIONYL CHLORIDE ACTIVE CATHODE ELECTROCHEMICAL CELL

Louis R. Giattino, Hollister, Calif., assignor to Vincent Owen Catanzarite, Las Vegas, Nev.

Continuation of Ser. No. 828,493, Aug. 29, 1977, abandoned.
This application Aug. 2, 1978, Ser. No. 930,374
Int. Cl.[2] H01M 6/14
U.S. Cl. 429—196 12 Claims

1. An electrochemical cell consisting essentially of a lithium anode; a carbonaceous current collector spaced from said anode; an ionically conductive electrolyte solution comprising an ionically conductive solute dissolved in thionyl chloride; and copper dispersed in said carbonaceous current collector.

4,167,609

ZINC OXIDE ADDITIVE FOR DIVALENT SILVER OXIDE ELECTRODES

Robert F. Scarr, Fairview Park, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,823
Int. Cl.[2] H01M 6/06
U.S. Cl. 429—206 13 Claims

1. An alkaline cell having a negative electrode, an alkaline electrolyte and a positive electrode comprising at least 50 weight percent of divalent silver oxide based on the dry weight of the positive electrode, the improvement comprising incorporating zinc oxide in an amount between about 2 and about 10 weight percent based on the dry weight of the divalent silver oxide in the positive electrode so as to reduce the duration of the divalent silver oxide voltage step during discharge of the cell.

4,167,610

ION EXCHANGE PRODUCTS AND PROCESSES USING CROSSLINKED ALLYLAMINE COPOLYMERS

Brian A. Bolto, Mitcham, and Kurt H. Eppinger, Bentleigh East, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Nov. 21, 1977, Ser. No. 853,812
Claims priority, application Australia, Dec. 13, 1976, PC 8477
Int. Cl.[2] C08F 291/12; C08J 7/02
U.S. Cl. 521—31 17 Claims

1. A process for the reduction of the swelling propensity of partially addition crosslinked polymeric material, capable of acting as an ion exchange material and derived from a monomer of the allylamine type, which process comprises treating the said polymeric material with a liquid capable of swelling said polymeric material and with a dihalo organic compound capable of causing further crosslinking in the said polymeric material.

4,167,611

METHOD OF PRODUCTION OF COMPOSITIONS WHICH EXHIBIT NO SHRINKAGE OR WHICH INCREASE IN VOLUME DURING SETTING

Lech Czarnecki; Mariusz Lyczkowski, and Marek Borowiak, all of Warsaw, Poland, assignors to Politechnika Warszawaska, Warsaw, Poland

Filed Mar. 15, 1977, Ser. No. 777,842
Claims priority, application Poland, Mar. 16, 1976, 187961
Int. Cl.[2] C08J 9/00
U.S. Cl. 521—88 9 Claims

1. In a method of producing a chemically set composition said method comprising the steps of mixing a chemically settable synthetic polymer with a filler and a setting system for said polymer and subjecting said mixture to a temperature which promotes setting, the improvement which consists of incorporating in said mixture before setting (a) 5–300% by weight based on the weight of said polymer of a porous expanding agent having sorption properties and selected from the group consisting of silica gels, aluminosilica gels, crystalline or partially crystalline natural or synthetic aluminosilicates, aluminum oxide, and activated magnesium oxide, said expanding agent being wetted with a first portion of an expansion promotor consisting of a polar solvent whose molecules have a critical diameter less than the critical diameter of the pores of said expanding agent, and (b) a second portion of said expansion promotor in an amount such that the total amount of said expansion promotor is 15–145% by weight based on the weight of said expanding agent and said first portion of said expansion promotor does not exceed 45% of the total amount of said added expansion promotor, whereby the volume of said mixture does not decrease upon setting.

4,167,612

FLEXIBLE POLYURETHANE FOAMS HAVING LOW RESISTANCE TO AIR FLOW AND METHOD FOR PREPARATION

Richard B. C. Tucker; Roland N. Fracalossi, and Mark T. Wajer, all of Baltimore, Md., assignors to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Filed Jun. 19, 1978, Ser. No. 916,745
Int. Cl.[2] B29D 27/00; C08G 18/14, 18/63, 18/32
U.S. Cl. 521—110 15 Claims

1. A flexible polyurethane foam characterized by its low resistance to air flow, high load bearing characteristics and high strength comprising the reaction product of a polyisocyanate; a polyol blend including from about 40–60 percent by weight of a polyether triol having an average molecular weight of about 4500 to about 6500 and from about 60–40 percent by weight of a reinforced polymer polyol having an average molecular weight of about 4500 to about 5500, said reinforcing of said polyol being through the addition of a stable dispersion of a vinyl polymer to said polyol in an amount of

from about 10 to 30 percent by weight of the polymer polyol; and a low molecular weight cross-linking agent selected from the group consisting of 1,4-cyclohexanedimethanol and 4,4'methylene-bis (2-chloroaniline).

8. The method of forming a flexible polyurethane foam characterized by its low resistance to air flow, high load bearing characteristics and high strength comprising the steps of (1) foaming a flexible polyurethane foam by reacting a polyisocyanate, a polyol blend including from about 40–60 percent by weight of a polyether triol having an average molecular weight of about 4500 to about 6500 and from about 60–40 percent by weight of a reinforced polymer polyol having an average molecular weight of about 4500 to about 5500, said reinforcing of said polyol being through the addition of a stable dispersion of a vinyl polymer to said polyol in an amount of from about 10 to 30 percent by weight of the polymer polyol; and a low molecular weight cross-linking agent selected from the group consisting of 1,4-cyclohexanedimethanol and 4,4'methylene-bis (2-chloroaniline); and (2) while said flexible polyurethane foam is in the "green" uncured state, compressing said foam in at least one direction to about 80 to 95 percent of the height of the block of foam.

4,167,613

PROCESS FOR FOAMING A POLYMERIZABLE MEDIUM USING ACID SENSITIVE AZO COMPOUNDS WITH A POLYMERIZABLE MONOMER AND FREE RADICAL INHIBITOR

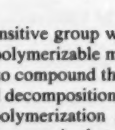
Ernest R. Kamens, and Vasanth R. Kamath, both of Tonawanda, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 723,680, Sep. 15, 1976, abandoned. This application Jun. 5, 1978, Ser. No. 912,675

Int. Cl.[2] C08J *9/10*

U.S. Cl. 521—118 **10 Claims**

1. In a process for preparation of a foamed polymer from a reaction mass comprised of a polyester and an ethylentically unsaturated monomer wherein the reaction mass is simultaneously foamed and cured in the presence of a free-radical initiator comprising one or more acid sensitive mono- or poly-azo compounds containing the group:



wherein Y is an acid sensitive group which in the presence of an acidulous or acidic polymerizable medium causes sufficient decomposition of the azo compound that gas is released in said medium and during said decomposition said mono- or poly-azo compound promotes polymerization and/or crosslinking of said medium to provide a matrix that is sufficiently polymerized and/or crosslinked that the generated gases caused the matrix to expand, each of the remaining valances being satisfied by an organic radical provided that any carbon atom that is directly linked to azo nitrogen, except that of a carbonyl group, has at least two of its remaining three valances satisifed by a carbon to carbon bond or a carbon to hydrogen bond, the improvement comprising adding to said reaction mass from 0.001 to 10% of at least one additional different compound which exerts an inhibiting effect on free-radical polymerization selected from the group consisting of (a) phenolic retarder selected from p-benzyloxyphenol, 2,6-diisopropylphenol, p-methoxyphenol, 2,3,4,6-tetramethylphenol or 2,4,6-trinitrophenol, (b) alkyl and aryl mercaptan chain transfer agent, and (c) free-radical scavenging unsaturated compound that is non-polymerizable by free-radical initiation selected from vinyl ethers, isopropenyl ethers, 2-butene, propene, isobutene or butene-1, in an amount effective to improve the efficiency of said foaming, whereby less foaming agent is required to obtain a foam of a given density than the amount of said foaming agent which would be required if said additional compound were not present.

4,167,614

PROCESS OF PRODUCING MULTI-ORIENTED FIBRES AND FILMS OF ALIPHATIC POLYAMIDES

Alberto Ciferri, Via Mazzini, 210, Bogliasco, Italy (16100); Domenico Acierno, Via D. Scina, 54, Palermo, Italy (90100), and Giovanni C. Alfonso, Frazione Rovereto, Gavi Ligure, Italy (15066)

Filed Oct. 8, 1976, Ser. No. 731,020

Claims priority, application Italy, Oct. 17, 1975, 12836 A/75

Int. Cl.[2] C08G *20/12*

U.S. Cl. 525—4 **15 Claims**

1. A process for increasing the modulus of elasticity of aliphatic polyamide fiber and film, comprising the steps:

a. forming an aliphatic polyamide-inorganic salt mixture, said inorganic salt being taken from the class consisting of alkaline metal salt and alkaline earth metal salt, said inorganic salt being present in an amount effective to reduce the melting temperature or crystallinity of the aliphatic polyamide;

b. mechanically orienting the aliphatic polyamide-salt mixture while in substantially an amorphous state; and

c. developing the crystallinity of the oriented aliphatic polyamide-salt mixture by heating, while under tension, at a temperature of at least 50° C. below the melting point of the polymer and for a time which is effective for increasing the modulus of elasticity to at least about 1000 kg/mm^2.

4,167,615

HYDROCARBON SOLUBLE CATALYST CONTAINING DINITROGEN OR DIHYDROGEN TRANSITION METAL COMPLEX

Donald E. Gessell, Baton Rouge, La., and Kirby Lowery, Jr., Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 693,071, Jun. 4, 1976, Pat. No. 4,091,082. This application Jan. 16, 1978, Ser. No. 869,545

Int. Cl.[2] C08F *4/62, 4/64, 4/68, 4/70*

U.S. Cl. 526—161 **2 Claims**

1. In a Ziegler polymerization process which involves contacting an α-olefin with a catalytic amount of a catalyst comprising a transition metal component and an organometallic reducing compound under conditions sufficient to polymerize the α-olefin, the process wherein the transistion metal component is a hydrocarbon-soluble complex of a transition metal comprising a transition metal of Groups 4b, 6b, 7b and 8 of Mendeleev's Periodic Table of Elements having a valence greater than two or divalent nickel, a number of halide anionic groups sufficient to satisfy the valence charge on the transition metal, and molecular nitrogen and/or molecular hydrogen bonded to the transition metal through a coordinate covalent bond.

4,167,616

POLYMERIZATION WITH DIBORANE ADDUCTS OR OLIGOMERS OF BORON-CONTAINING MONOMERS

Joseph M. Bollinger, North Wales, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 22, 1977, Ser. No. 826,230

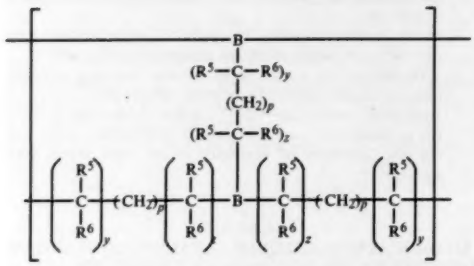
Int. Cl.[2] C08F *4/44, 2/06*

U.S. Cl. 526—197 **17 Claims**

1. A process for the polymerization of polymerizable α,β-ethylenically unsaturated monomers which comprises polymerizing said monomers in a reaction mixture containing catalytic amounts of (A) an oxygen source and (B) an organic boron compound which is soluble in the reaction mixture, said boron compound selected from (1) diborane adducts wherein the boron atoms are linked by a hydrocarbyl group having an aliphatic carbon atom bonded to at least one of the boron

atoms, and (2) oligomers based on repeating units containing at least two boron atoms linked by hydrocarbyl groups having an aliphatic carbon atom bonded to at least one of the boron atoms, said diborane adducts having the formula:

where x is 0 to 6 and m and n are each 0 or 1, provided that the sum of x, m and n is at least 1, and where R^1, R^2, R^3 and R^4 independently are hydrogen, alkyl, cycloalkyl or aryl, and where R^1 together with R_2 and the boron atom to which R^1 and R^2 are attached may form a ring containing 2 to 14 carbon atoms, such boron atom being a member of the ring or bridging the ring; and said repeating units of said oligomers having the formula:



where y and z are each 0 to 5 and p is 0 or 1 provided that the sum of y, z and p is at least 1; where R^5 and R^6 independently are hydrogen, alkyl, cycloalkyl or aryl, and where terminal carbon atoms of one unit are attached to separate boron atoms in adjacent units, and the terminal boron atom of one unit being joined to separate terminal carbon atoms of adjacent units.

4,167,617

RAPIDLY CURABLE SILOXANE COMPOSITION

Mark W. Siefken, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 659,526, Feb. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 556,495, Mar. 7, 1975, Pat. No. 4,020,043. This application Jan. 3, 1978, Ser. No. 866,351

Int. Cl.[2] C08G *77/06*

U.S. Cl. 528—23 **10 Claims**

1. A method of curing at least one silane compound of the formula

$$X_mSiR_{4-m}$$

wherein

X is a labile group

R is a hydrocarbyl group, and

m is 2, 3, or 4

comprising curing the said at least one silane compound by placing said compound into catalytic proximity with a catalytically active amount of a highly fluorinated aliphatic sulfonyl catalyst having two or three highly fluorinated aliphatic sulfonyl groups attached directly to an imide or methylene group, and water.

4,167,618

POLYMERIZATION PROCESS FOR AZIRIDINE COMPOUNDS

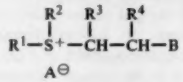
Werner Schmitt; Robert Purrman, both of Starnberg; Peter Jochum, and Wolf-Dieter Zahler, both of Hechendorf, all of Fed. Rep. of Germany, assignors to ESPE Fabrik Pharmazeutischer Praparate GmbH, Seefeld, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 568,156, Apr. 15, 1975, abandoned. This application Dec. 29, 1977, Ser. No. 865,749

Int. Cl.[2] C08G *73/04*

U.S. Cl. 528—424 **9 Claims**

1. An improved process for the production of an aziridine polymer which comprises mixing an aziridine compound with a polymerization initiator having the formula:



where

R^1 is an alkyl radical of 1 to 18 C atoms,

R^2 is an alkyl radical of 1 to 18 C atoms or a phenyl alkyl radical of 7 to 18 C atoms, wherein said alkyl radicals may contain an ester group and/or ether group, R^3 and R^4 are hydrogen, an alkyl radical of 1 to 18 C atoms,

and/or an aryl radical which can be substituted with a chloro, nitro or alkoxy group, whereby the alkyl radicals of R^3 and R^4 together or in combination with B can form a cycloaliphatic or heterocyclic ring, B is an electron attracting radical, and A is a non-nucleophilic anion, the polymerization initiator being present in an amount effective to polymerize said aziridine compound.

4,167,619

PURIFICATION OF PROPYLENE POLYMERIZATION PRODUCT

Abraham Van Mannekes, The Hague; Ross T. Channon, and Jan W. De Beukelaar, both of Amsterdam, all of Netherlands, assignors to Shell Development Company, Houston, Tex.

Continuation of Ser. No. 775,488, Mar. 8, 1977, abandoned, which is a continuation of Ser. No. 646,443, Jan. 5, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 898,349

Claims priority, application United Kingdom, Jan. 7, 1975, 582/75

Int. Cl.[2] C08F *6/02, 6/28*

U.S. Cl. 528—483 **7 Claims**

1. A process for the purification of a propylene polymer obtained by polymerization with the aid of a catalyst consisting essentially of a titanium halide and an organoaluminum compound which process consists essentially of the steps of

(a) contacting at a temperature in the range from 20° to 80° a reaction product slurry of the solid polymer in a liquid C_3 hydrocarbon medium consisting predominantly of propylene with (1) from 0.01 to 7% by weight (based on the liquid phase) of an alkanol having 3 to 4 carbon atoms per molecule and (2) an oxygen donor selected from at least 0.1 mole of oxygen and an equivalent amount of an effective peroxide, per gram atom of titanium present in the slurry, said oxygen donor being added simultaneously with or subsequent to the addition of said alkanol, but prior to any separation of the solid polymer from the liquid medium, and

(b) washing the polymer, either by countercurrent contact of the slurry or after separation of the bulk of the liquid medium, at a temperature in the range from 10° to 80° C. with a C_3 hydrocarbon liquid medium consisting predominantly of clean propylene, free of catalyst residue, in the presence of 0.1 to 7% by weight (based on the wash liquid) of an alkanol having 3 or 4 carbon atoms per molecule, and

(c) recovering washed polymer.

4,167,620

METHOD FOR HEAT TREATING SHAPED ARTICLES OF AMIDE-IMIDE OR AMIC ACID POLYMERS

Yu-Tsai Chen, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 1, 1978, Ser. No. 874,131
Int. Cl.[2] C08G *73/14*
U.S. Cl. 528—481 13 Claims

1. A process for heat treating a shaped article of polyamide-imide or polyamic acid comprising the steps of (1) preheating the article to vaporize and remove volatiles contained in the article and generated therein, and increase the deflection temperature of the polymer, as determined by A.S.T.M. D-648-72, by about 15° to about 35° F. without deformation of the article; and (2) heating the article at about 5° to about 25° F. below the increased deflection temperature to progressively increase the deflection temperature to substantially its maximum attainable value without deformation of the article; said preheating and heating being carried out in the presence of a circulating gas.

4,167,621

METHOD FOR PREPARING STARCH ETHER DERIVATIVES

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Jun. 26, 1978, Ser. No. 918,709
Int. Cl.[2] C08B *31/16, 33/06*
U.S. Cl. 536—108 12 Claims

1. A method for preparing a starch ether derivative which comprises the steps of:

a. reacting a starch base with about 0.5–100% by weight of neutralized alkyl 3-chloro-2-sulfopropionate, based on dry starch, wherein the alkyl group has 1–6 carbon atoms; and

b. isolating the resultant starch.

4,167,622

PROCESS FOR PREPARING HYDROXYETHYL STARCH SUITABLE AS A PLASMA EXPANDER

Karl Holzer, Linz, Austria, assignor to Laevosan-Gesellschaft mbH & Co KG, Linz, Austria

Filed Apr. 7, 1978, Ser. No. 894,447
Claims priority, application Austria, Apr. 8, 1977, 2489/77
Int. Cl.[2] C08B *33/04*
U.S. Cl. 536—111 1 Claim

1. In a process for preparing hydroxyethyl starch suitable as a plasma expander by alkaline hydroxyethylation of starch, neutralization of the resulting reaction mixture, extraction of the formed hydroxyethyl starch from the neutralized reaction mixture with a solvent and precipitation of the hydroxyethyl starch from the solution resulting from the extraction, the improvement which comprises the use of dimethylformamide as extracting solvent.

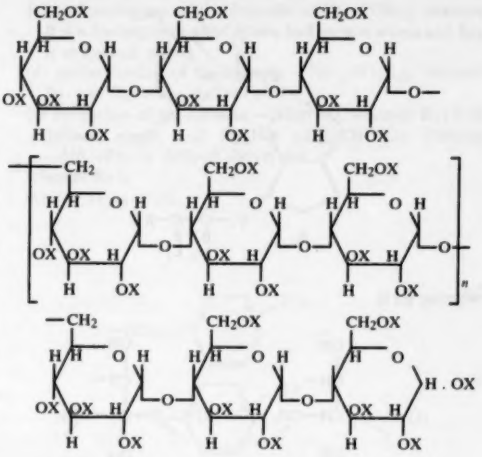
4,167,623

PULLULAN AMINOALKYL ETHER

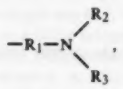
Fumio Fujita, Osaka; Kosuke Fukami, Settsu, and Masanori Fujimoto, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Inc., Okayama, both of, Japan

Filed Nov. 3, 1977, Ser. No. 848,033
Claims priority, application Japan, Nov. 8, 1976, 51-134401
Int. Cl.[2] C07H *15/04*
U.S. Cl. 536—120 7 Claims

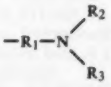
1. A pullulan aminoalkyl ether of the formula



wherein n is an integer of 20 to 4,000 and X is H or a group represented by the general formula



where R_1 is an alkylene group having 1 to 5 carbon atoms or a hydroxyalkylene group having 1 to 4 carbon atoms and R_2 and R_3 are each H, or an alkyl group having 1 to 4 carbon atoms; the number ratio of hydrogen atom to the group



in X in one molecule being 0.001 to 2.0, and its salts including quaternary alkylamine salts thereof which are formed with an alkyl halide having 1 to 4 carbon atoms.

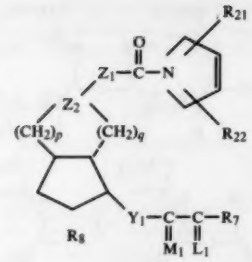
4,167,624

5-HYDROXY-PGI$_1$ PYRROLINYLAMIDES

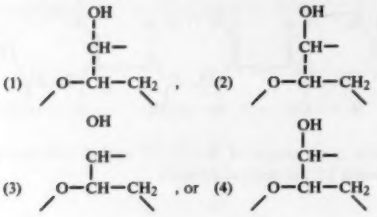
Roy A. Johnson, and John C. Sih, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 815,648, Jul. 14, 1977, Pat. No. 4,110,532. This application Apr. 24, 1978, Ser. No. 899,203
Int. Cl.[2] C07D *405/02*
U.S. Cl. 542—426 47 Claims

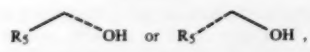
1. A prostacyclin analog of the formula



wherein Z_2 is



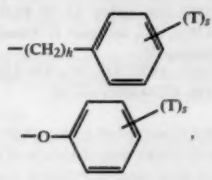
wherein one of p or q is the integer zero or one and the other is the inteqer zero;
wherein Z_1 is
(1) $-(CH_2)_q-CH_2-CH_2-$,
(2) $-(CH_2)_g-CH_2-CF_2-$, or
(3) trans$-(CH_2)_g-CH=CH-$,
wherein g is the integer one, 2, or 3 when q is zero and zero, one, or 2 when q is one;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein Y_1 is
(1) trans$-CH=CH-$,
(2) cis$-CH=CH-$,
(3) $-CH_2CH_2-$,
(4) trans$-CH=C(Hal)-$, or
(5) $-C\equiv C-$
wherein Hal is chloro or bromo;
wherein M_1 is



wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive:
wherein L_1 is

or a mixture of

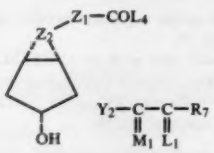
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive; and
wherein R_7 is
(1) $-(CH_2)_3-CH_3$,



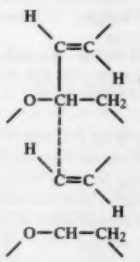
wherein h is the integer zero or one; s is the integer zero, one, 2, or 3; and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or with the proviso that not more than two T's are other than alkyl.

4,167,625
TRANS-4,5,13,14-TETRADEHYDRO-PGI$_1$ AMIDES
Herman W. Smith, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Continuation-in-part of Ser. No. 821,536, Aug. 3, 1977. This application Jun. 14, 1978, Ser. No. 915,350
Int. Cl.^{2} C07D *307/93*
U.S. Cl. 542—430 **30 Claims**

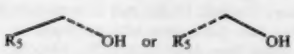
1. A prostacyclin analog of the formula



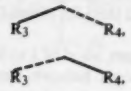
wherein Y_2 is $-C\equiv C-$;
wherein Z_2 is



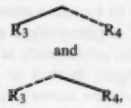
wherein Z_1 is
(1) $-(CH_2)_g-CH_2-CH_2-$, or
(2) $-(CH_2)_g-CH_2-CF_2-$,
wherein g is the integer zero, one, or 2;
wherein M_1 is



wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive;
wherein L_1 is



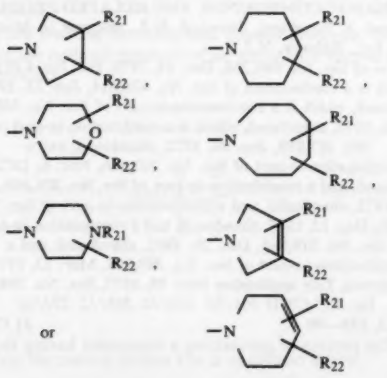
or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; wherein L_4 is

(a) amino of the formula $—NR_{21}R_{22}$; wherein R_{21} and R_{22} are hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive; hydroxy, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive, or nitro; carboxyalkyl of one to 4 carbon atoms, inclusive; carbamoylalkyl of one to 4 carbon atoms, inclusive; cyanoalkyl of one to 4 carbon atoms, inclusive; acetylalkyl of one to 4 carbon atoms, inclusive; benzoylalkyl of one to 4 carbon atoms, inclusive, benzoylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, alkoxy of one to 3 carbon atoms, inclusive, carboxy, alkoxycarbonyl of one to 4 carbon atoms, inclusive; or nitro; pyridyl; pyridyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive; pyridylalkyl of one to 4 carbon atoms, inclusive; pyridylalkyl substituted by one, 2, or 3 chloro, alkyl of one to 3 carbon atoms, inclusive, hydroxy, or alkoxy of one to 3 carbon atoms, inclusive; hydroxyalkyl of one to 4 carbon atoms, inclusive; dihydroxyalkyl of one to 4 carbon atoms, and trihydroxyalkyl of one to 4 carbon atoms; with the further proviso that not more than one of R_{21} and R_{22} is other than hydrogen or alkyl;

(b) cycloamino selected from the group consisting of



wherein R_{21} and R_{22} are defined above;

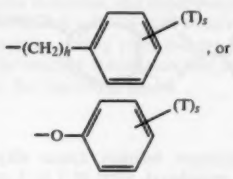
(c) carbonylamino of the formula $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of one to 4 carbon atoms and R_{21} is as defined above;

(d) sulfonylamino of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or

(e) hydrazino of the formula $—NR_{23}R_{24}$, wherein R_{23} is as defined above and R_{24} is amino of the formula $—NR_{21}R_{22}$, as defined above; and

wherein R_7 is

(1) $—(CH_2)_m—CH_3$,



(2)

, or

(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl.

4,167,626

TRIAZOLYL STILBENE TRIAZOLES

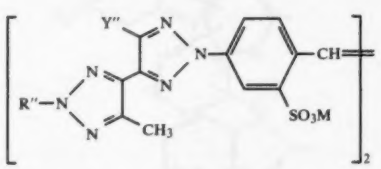
Fritz Fleck, Bottmingen, Switzerland; Alec V. Mercer, Leeds, and Roger Paver, Bingley, both of England, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 603,252, Aug. 11, 1975, abandoned. This application Jul. 22, 1977, Ser. No. 818,007

Int. Cl.[2] C07D *403/14*

U.S. Cl. 542—435 **11 Claims**

1. A compound of formula I",



I"

in which Y" signifies —COOM, $—COOR_1"$, $—CONH_2$, or $—SO_3M$,

R" signifies phenyl, unsubstituted or mono- or di-substituted by methyl, C_{1-2}alkoxy, chlorine, cyano, $—CONH_2$, —COOM, $—COOR_1"$, $—SO_2CH_3$, SO_2NH_2 or $—SO_3M$,

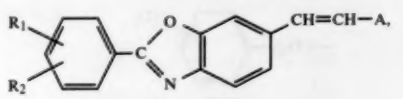
$R_1"$ signifies C_{1-2}alkyl, and

the M's are, independently, hydrogen or a non-chromophoric cation.

4,167,627
Patent Not Issued For This Number

4,167,628
NOVEL BENZOXAZOLE COMPOUNDS
Geza Kormany, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.J.
Filed Dec. 9, 1977, Ser. No. 858,989
Claims priority, application Luxembourg, Dec. 23, 1976, 76467
Int. Cl.[2] C07D *413/02, 263/54*
U.S. Cl. 542—454 **19 Claims**

1. Benzoxazole compounds of the formula

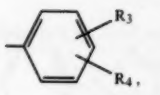


wherein

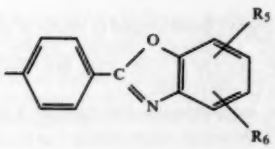
R_1 represents hydrogen, halogen, cyano, alkyl of 1 to 8 carbon atoms, cyclohexyl, alkyl of 1 to 4 carbon atoms which is substituted by halogen, cyano, alkoxy of 1 to 4 carbon atoms or phenyl, while the phenyl moiety of a phenylalkyl radical can contain in addition one or two substituents selected from the group consisting of halogen, methyl or methoxy; alkoxy of 1 to 4 carbon atoms which is unsubstituted or substituted by cyano or alkoxy of 1 to 4 carbon atoms; phenyl or phenoxy which is unsubstituted or substituted by one or two radicals selected from the group consisting of halogen, cyano, alkyl or alkoxy, each of 1 to 4 carbon atoms; the sulpho group and the derivatives thereof; the carboxyl group and the derivatives thereof; a sulphonyl group; or together with R_2 in the ortho-position represents an alkylene radical of 3 or 4 carbon atoms or the butadienylene radical,

R_2 represents hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, or together with R_1 in the ortho-position represents an alkylene radical of 3 or 4 carbon atoms or the butadienylene radical, and

A represents a group of the formula



or



wherein

R_3 represents a carboxyl group and the derivatives thereof, a sulpho group and the salts thereof, a sulphonyl or cyano group,

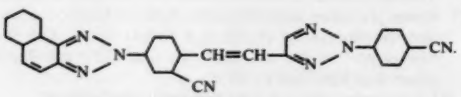
R_4 represents hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, the sulpho group and the salts thereof or the carboxyl group and the derivatives thereof,

R_5 represents hydrogen, alkyl of 1 to 8 carbon atoms, alkyl of 1 to 4 carbon atoms which is substituted by halogen, cyano, alkoxy of 1 to 4 carbon atoms or phenyl, while the phenyl moiety of a phenylalkyl radical can contain in addition one or two substituents selected from the group consisting of halogen, methyl or methoxy; cyclohexyl; alkoxy of 1 to 4 carbon atoms which is unsubstituted or substituted by cyano or alkoxy of 1 to 4 carbon atoms; phenyl or phenoxy which is unsubstituted or substituted by one or two radicals selected from the group consisting of halogen, cyano, alkyl or alkoxy, each of 1 to 4 carbon atoms; halogen, cyano, sulphonyl, the carboxyl group or the derivatives thereof; the sulpho group or the derivatives thereof; or together with R_6 in the ortho-position represents an alkylene radical of 3 or 4 carbon atoms or the butadienylene radical; and

R_6 represents hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, or together with R_5 in the ortho-position represents an alkylene radical of 3 or 4 carbon atoms or the butadienylene radical.

4,167,629
TRIAZOLYLSTYRENE COMPOUNDS
Fritz Fleck, Bottmingen, and Horst Schmid, Münchenstein, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland
Continuation of Ser. No. 306,146, Nov. 13, 1972, abandoned. This application Nov. 7, 1974, Ser. No. 521,642
Claims priority, application Switzerland, Nov. 19, 1971, 16866/71
Int. Cl.[2] C07D *403/10*; C09B *23/14*
U.S. Cl. 542—456 **1 Claim**

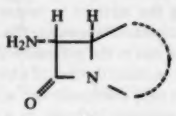
1. The compound of formula Ib,



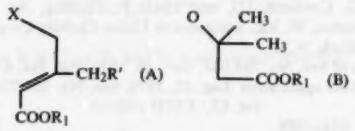
Ib

4,167,630
PROCESS FOR EPIMERIZING BETA-LACTAM ANTIBIOTIC COMPOUNDS, AND RELATED PRODUCTS
Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.
Division of Ser. No. 644,250, Dec. 24, 1975, Pat. No. 4,051,132, which is a continuation of Ser. No. 436,014, Jan. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 350,543, Apr. 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 267,858, Jun. 30, 1972, abandoned, and a continuation-in-part of Ser. No. 303,906, Nov. 6, 1972, abandoned, and a continuation-in-part of Ser. No. 306,066, Nov. 13, 1972, abandoned, and a continuation-in-part of Ser. No. 314,484, Dec. 12, 1972, abandoned, and a continuation-in-part of Ser. No. 319,945, Dec. 29, 1972, abandoned, and a continuation-in-part of Ser. No. 340,804, Mar. 13, 1973, abandoned. This application May 19, 1977, Ser. No. 798,287
Int. Cl.[2] C07D *263/52, 239/70, 265/12, 221/02*
U.S. Cl. 544—90 **21 Claims**

1. The process of epimerizing a compound having the formula:

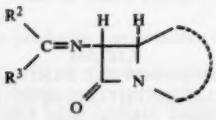


wherein the symbol indicated as a curved broken line represents the following:



wherein R_1 is an easily removable ester blocking group; R' is hydrogen, halo, loweralkanoyloxy, carbamoyloxy, furyl, thienyl, thiazolyl, thiadiazolyl, pyrrolyl, or tetrazolyl; each of which can be substituted with a lower alkyl substituent of 1–6 carbon atoms; X is divalent radical, —O—, CH_2—, or —NQ—, wherein Q is hydrogen, formyl, benzyl, or loweralkyl; which comprises the steps of:

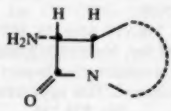
(a) reacting the compound above with an aromatic or aliphatic aldehyde or ketone to yield an intermediate of the formula:



wherein the broken curved line is as defined above, and R^2 is loweralkyl or phenyl and R^3 is hydrogen, loweralkyl or phenyl;

(b) and treating the latter intermediate with a base sufficiently strong to convert the aldimino compound to its anionic form said treatment conducted in the presence of an aprotic solvent and the optional presence of a dipolar aprotic co-solvent, followed by addition of a molecular excess of acid, a carboxylic acid having from 1–5 carbon atoms;

(c) and reacting the compound thereby produced with acid in the optional presence of an amine, and recovering the product,



wherein the curved broken line is as defined above.

4,167,631

PROCESS FOR THE PREPARATION OF CYANURIC ACID

Augustinus P. H. Schouteten, Maastricht, and Marinus J.A.M. Den Otter, Munstergeleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation of Ser. No. 703,655, Jul. 8, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,912

Claims priority, application Netherlands, Jul. 8, 1975, 7508098

Int. Cl.[2] C07D *251/32*

U.S. Cl. 544—192 **10 Claims**

1. In a process for the preparation of cyanuric acid by heating a reaction solution of urea, biuret or mixtures thereof in a solvent and stripping the solution with a stripping gas to remove ammonia therefrom, the improvement which comprises stripping the reaction solution with an inert auxiliary stripping substance having a boiling point ranging between that of ammonia and the reaction temperature and being from about 25° to 180° C. at the reaction pressure.

4,167,632

DERIVATIVES OF 3-PHENYLISOINDOLE-1-CARBOXYLIC ACID

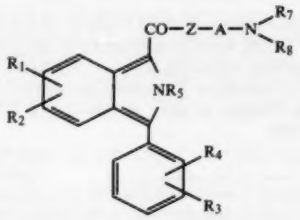
Roland Jaunin, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 789,905, Apr. 22, 1977, Pat. No. 4,122,265. This application Jul. 26, 1978, Ser. No. 928,135

Int. Cl.[2] C07D *413/12, 209/44*

U.S. Cl. 544—143 **6 Claims**

1. A compound of the formula



I

wherein A is alkylene of 2 to 8 carbon atoms; Z is oxygen; R_1, R_2, R_3 and R_4, independently, are hydrogen, halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms or trifluoromethyl; R_5 and R_6, independently, are hydrogen or alkyl of 1 to 6 carbon atoms; and R_7 and R_8, independently, are hydrogen, alkyl of 1 to 6 carbon atoms, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl-alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms-alkyl of 1 to 6 carbon atoms, phenyl, halophenyl or methoxyphenyl, or R_7 and R_8, when taken together, are a group of the formula $—(CH_2)_n—$, wherein n is an integer of from 2 to 7 or $—NR_7R_8$ is morpholino or piperazino which

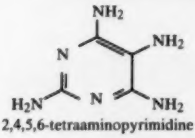
may be substituted with alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 1 to 6 carbon atoms,
or a pharmaceutically acceptable acid addition salt thereof.

4,167,633
PREPARATION OF 2,4,5,6-TETRAAMINOPYRIMIDINE FROM 2,4,6-TRIAMINOPYRIMIDINE

Thomas J. Morrow, Dayton, Ohio, assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

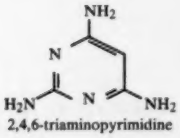
Filed Jul. 20, 1977, Ser. No. 817,377
Int. Cl.[2] C07D *239/46*
U.S. Cl. 544—323 **6 Claims**

1. A process of preparing



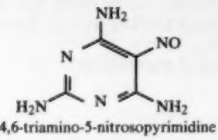
2,4,5,6-tetraaminopyrimidine

from



2,4,6-triaminopyrimidine

which comprises forming a nitroso intermediate



2,4,6-triamino-5-nitrosopyrimidine

in situ at low temperatures of about 0°–20° C. in the presence of $NaNO_2$, HOAc and water to produce a stirrable slurry, and subsequently without separating and in a sequential reaction reducing the 5-nitroso group to 5-amino by means of a reducing agent and filtering to give a solution of 2,4,5,6-tetraaminopyrimidine.

4,167,634
MANUFACTURE OF A PIGMENTARY FORM OF α-INDANTHRONE

Helmut Hoch; Heinrich Hiller, both of Wachenheim, and Guenther Bauni, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 874,789
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1977, 2705107
Int. Cl.[2] C09B *5/48*
U.S. Cl. 544—339 **12 Claims**

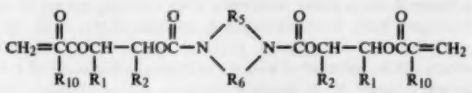
1. In a process for the manufacture of a pigmentary form of α-indanthrone by swelling γ-indanthrone in sulfuric acid of from 73 to 80 percent strength by weight at from 20° to 50° C., and precipitating the mixture in water at below 50° C., and isolating the precipitated pigment, the improvement that the swelling is carried out in the presence of from 0.1 to 20 percent by weight, based on indanthrone, of a hydroxylammonium salt, of a hydrazinium salt, amidosulfonic acid, urea, a salt of urea, formaldehyde, paraformaldehyde, or a mixture thereof.

4,167,635
N,N-ACRYLOXY ETHOXY PIPERAZINES

Frank G. Cowherd, III, and Louis F. Theiling, Jr., both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 755,063, Dec. 28, 1976, Pat. No. 4,126,747. This application Aug. 25, 1978, Ser. No. 936,726
Int. Cl.[2] C07D *295/18*
U.S. Cl. 544—388 **2 Claims**

1. A carbamoyloxy acrylate compound of the formula



wherein R_1 and R_2 are each hydrogen or alkyl of up to 10 carbon atoms; R_5 and R_6 are each methylene, ethylene, or 1,2-propylene; and $R_{10}$is hydrogen or methyl.

4,167,636
7,8-DIHYDROISOMORPHINE DERIVATIVE, NAMELY AZIDOETHYLMORPHINE

Rezso Bognar; Sandor Makleit; Geza Kiss; Sandor Berenyi; Terez Mile, all of Debrechen; Jozsef Knoll, Budapest; Sandor Elek, Tiszavasvari; Istvan Gyoker, Tiszavasvari; Attila Zoltai, Tiszavasvari; Gyorgy Toth, Tiszavasvari, and Laszlo Litkei, Tiszavasvari, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti, Budapest, Hungary

Continuation of Ser. No. 681,214, Apr. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 502,729, Sep. 3, 1974, abandoned. This application Mar. 29, 1978, Ser. No. 891,195
Claims priority, application Hungary, Sep. 4, 1973, 13616
Int. Cl.[2] C07D *489/00*; A61K *31/485*
U.S. Cl. 546—46 **1 Claim**

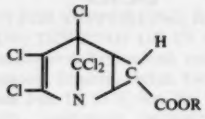
1. 3-O-ethyl-6-deoxy-6-azido-7,8-dihydroisomorphine or a pharmaceutically acceptable salt thereof.

4,167,637
POLYCYCLIC CHLORINATED AMINES

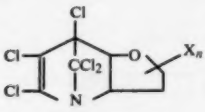
John L. Wong, Louisville, Ky., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 778,114, Mar. 16, 1977, Pat. No. 4,115,391, which is a division of Ser. No. 672,322, Mar. 31, 1976, Pat. No. 4,081,448, which is a continuation-in-part of Ser. No. 454,576, Mar. 25, 1974, abandoned. This application Feb. 8, 1978, Ser. No. 876,136
Int. Cl.[2] C07D *405/14, 411/14, 491/08*
U.S. Cl. 546—80 **1 Claim**

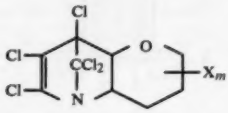
1. A compound having a structural formula selected from the group consisting of:



wherein R is H_2,lower alkyl;



wherein X is Cl or Br and N is an integer from 0 to 6;



wherein X is Cl or Br and m is an integer from 0 to 8.

4,167,638

PROCESS FOR PRODUCTION OF 8-NHR QUINOLINES

Eugene H. Chen, Marlton, N.J.; Andrew J. Saggiomo, and Edward A. Nodiff, both of Philadelphia, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 3, 1977, Ser. No. 774,165

Int. Cl.[2] C07D *215/40*

U.S. Cl. 546—171 **10 Claims**

1. A process for producing anti-parasitic compounds having a formula of:

QNHR

wherein Q represents a substituted or unsubstituted 8-quinolyl moiety and R represents an amino or amido substituted alkyl grouping comprising: reacting Q—NH_2 with R—X wherein X is a halogen selected from the group consisting of chloride, bromide, and iodide in the presence of a trialkyl or dialkyl amine acid acceptor having a boiling point of from 80°-90° C., wherein the amine acid acceptor is added incrementally during the reaction or both amine acid acceptor and R—X are added incrementally during the reaction, to form QNHR and HX.

4,167,639

FLUORINATED SULFOSUCCINATES

Seigfried Billenstein, Burgkirchen; Heinz Brecht, Bad Soden, and Dieter Hoffmann, Bobingen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 657,549, Feb. 12, 1976, abandoned, which is a continuation of Ser. No. 477,321, Jun. 6, 1974, abandoned. This application Feb. 17, 1978, Ser. No. 878,881

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1973, 2329660

Int. Cl.[2] C09G *1/08*

U.S. Cl. 560—151 **10 Claims**

1. A compound of the formula

(a) $R—O—CO—CH_2—CH(SO_3M)—CO—O—R^1$

in which R is a group of the formula

$R_f—(CH_2)_m—(OCH_2CH_2)_n—$

wherein R_f is straight-chain or terminally methyl-branched perfluoroalkyl of 2 to 8 carbon atoms, m is a number of 1 to 4, n is a number of zero to 3, M is hydrogen, an alkali metal,

(b) ammonium, monoethanolammonium, diethanolammonium, triethanolammonium, glycinium, taurinium, and N-methyltaurinium, and R^1 is defined as R or as M.

4,167,640

5-FLUORO-2-METHYL-IND-1-ENE-3-ACETIC ACID

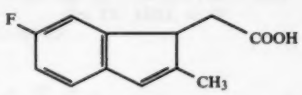
Roger J. Tull, Metuchen, and David G. Melillo, Scotch Plains, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 725,593, Sep. 22, 1976, Pat. No. 4,123,457, which is a division of Ser. No. 511,349, Oct. 2, 1974, Pat. No. 3,998,875. This application Jul. 17, 1978, Ser. No. 925,656

Int. Cl.[2] C07C *63/337*

U.S. Cl. 562—405 **1 Claim**

(c) 1. A compound of the formula:



4,167,641

PREPARATION OF LONG-CHAIN CARBOXYLIC ACIDS AND ALCOHOLS

Andrew J. Welebir, 1008 Steeples Ct., Falls Church, Va. 22046

Filed Sep. 1, 1978, Ser. No. 939,056

Int. Cl.[2] C07C *29/00*; C11C *1/00*

U.S. Cl. 568—884 **10 Claims**

1. In a process for the preparation of long-chain carbon compounds, the improvement which comprise:

a. reacting a 21 to 29 carbon carboxylic acid with a chlorinating agent to form the acid chloride;

b. separating the acid chloride and reacting it with an enamine and a hindered tertiary amine in an organic solvent while maintaining the reaction temperature at 30° to 60° C.;

c. removing the solvent and recovering the beta-diketone product;

d. reacting the beta-diketone with a solution of an alkali metal hydroxide or alkoxide and alcohol; and

e. recovering the precipitated product.

5. The process of claim 1 wherein the precipitated product is acidified to form the keto acid.

7. The process of claim 5 wherein the keto acid is reduced to form a long-chain carboxylic acid.

8. The process of claim 7 wherein the long chain carboxylic acid is further reduced to form the respective alcohol.

4,167,642

COLUMN FOR SUPPORTING, RAISING AND SWIVELLING THE ROOF OF AN ARC FURNACE

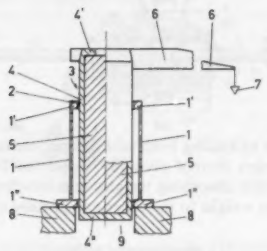
Karl Bühler, Nussbaumen, Switzerland, assignor to BBC Brown Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 17, 1978, Ser. No. 878,891

Claims priority, application Switzerland, Mar. 8, 1977, 2860/77

Int. Cl.[2] H05B 7/10

U.S. Cl. 13—14 10 Claims



1. A column for supporting, raising and swivelling the roof of an arc furnace comprising:

a foundation;

a vertically oriented cylinder mounted on said foundation;

an iron tube disposed in said cylinder and vertically movable therein, with the upper end of said iron tube extending from the upper end of said cylinder, said upper end of said iron tube being adapted to support the arc furnace roof; and

said iron tube being at least partially filled with a solid filler material.

4,167,643

ELECTRODE JOINTS

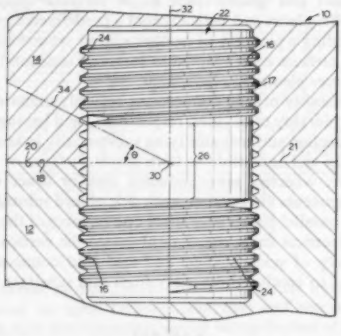
John A. Charnock, Toronto, Canada, assignor to ERCO Industries Limited, Islington, Canada

Filed Apr. 10, 1978, Ser. No. 894,718

Claims priority, application United Kingdom, Apr. 12, 1977, 14991/77

Int. Cl.[2] H05B 7/14

U.S. Cl. 13—18 C 4 Claims



1. An electrode joint comprising:

a first generally cylindrical electrode segment having a planar end face and a generally axial threaded bore in said end face,

a second generally cylindrical electrode segment having a planar end face and a generally axial threaded bore in said end face wherein the threads have the same pitch as those in said first axial bore,

said first and second electrode segments being arranged in end face-abutting relationship to define an interfacial plane,

a cylindrical threaded nipple threadedly engaged in said bore in both said first and second electrode segments to maintain said segments in said face-abutting relationship, and constructed of a material of a lesser coefficient of thermal expansion than the material of said electrode segments,

the threads in each said bore and the threads of said nipple being in engagement on the adjacent flank portions thereof closest to said interfacial plane,

the point of intersection of the axis of said nipple and electrode segments and said interfacial plane constituting a neutral point for thermal expansion of said joint,

for each said bore at least the threads located between said interfacial plane and the thread whose net direction of thermal expansion from the neutral point is at an angle at least equal to the thread pitch are inactivated, whereby the threads are self-tightening with increasing temperature in the portion of each said bore wherein said threads are active.

4,167,644

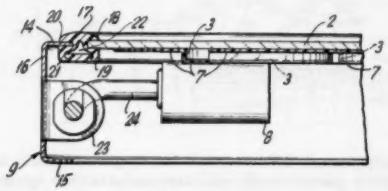
SOLAR CELL MODULE

William T. Kurth, South Hamilton, and Steven G. Miles, North Billerica, both of Mass., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 29, 1978, Ser. No. 947,018

Int. Cl.[2] H01L 31/04

U.S. Cl. 136—89 EP 12 Claims



1. A solar cell module comprising:

a rigid, light transparent sheet having a top surface and a bottom surface;

a plurality of silicon solar cells arrayed on the bottom surface of said sheet and bonded thereto by a silicon encapsulant;

a junction box bonded to the bottom surface of said sheet;

interconnecting means operatively interconnecting said silicon solar cells and terminating in said junction box;

a rigid frame extending around the perimeter of said sheet for supporting said sheet, said frame having at least one flange extending inwardly, said inwardly extending flange being essentially coplanar with said sheet for supporting engagement with a setting strip and a setting strip of resilient material interconnecting said sheet and said frame, said setting strip having parts embracing the flange and marginal edge of said sheet.

4,167,645

ELECTRICAL CURRENT-CARRYING FLUID HOSE CONSTRUCTION

Richard D. Carey, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Nov. 14, 1977, Ser. No. 851,090

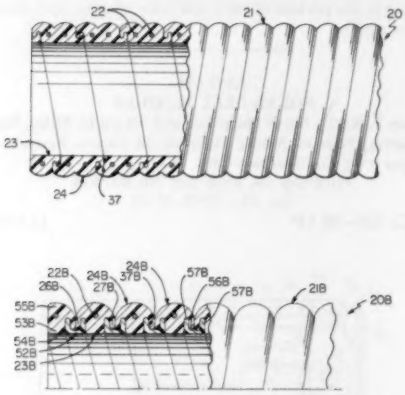
Int. Cl.[2] F16L 11/12; A47L 9/24

U.S. Cl. 174—47 15 Claims

1. A fluid hose construction having an outwardly convoluted configuration, integral electrical conductor means, and a substantially smooth inside surface for minimum obstruction to

fluid flow therethrough, said hose construction comprising; at least one elongated polymeric strip having a central body of solid cross section and having first and second projections extending from opposite side portions of said central body as a single-piece construction, said projections being disposed in parallel relation and parallel to said central body, each of said projections being defined by a pair of parallel planar surfaces interconnected at their terminal edges by a semicylindrical surface; said one strip being wound in a helical pattern with its projections connected to define said hose construction; said central body having outwardly convex arcuate surface means comprising a pair of semicylindrical surfaces having a common longitudinal edge forming said outwardly convoluted configuration, and a substantially flat surface which comprises said substantially smooth inside surface; said integral electrical conductor means extending through said central body.

12. A fluid hose construction having an outwardly convoluted configuration, integral electrical conductors, and a substantially smooth inside surface for minimum obstruction to fluid flow therethrough, said hose construction comprising first and second identical elongated polymeric strips; each of said strips having a substantially T-shaped cross-sectional configuration being defined by a vertical leg having a flat bottom surface and a transverse arm having first and second projections defined as an integral portion thereof, said transverse arm and projections comprising an outwardly convex arcuate surface; a U-shaped connector connecting an adjacent projection of each strip, said strips and said connector being wound in a helical pattern and interconnected to define said hose construction; each of said strips having its leg disposed toward the center of said hose construction with the bottom flat surface of said leg comprising said inside surface, and the transverse arm comprising said outwardly convoluted configuration; one of said electrical conductors extending through each of said strips to define a pair of conductors extending throughout said hose.



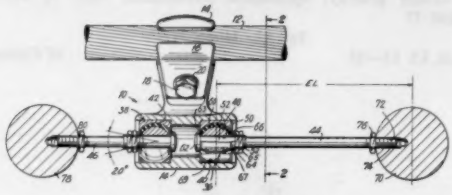
4,167,646

VIBRATION DAMPER

Charles Mathieu, Rain, Austria, assignor to Willy Frankel and Claudia Frankel, both of Englewood Cliffs, N.J.

Filed Jan. 23, 1978, Ser. No. 871,225
Int. Cl.[2] H02G *7/14*
U.S. Cl. 174—42 **15 Claims**

1. In a vibration damper which includes a damper housing and means to attach said housing to a body to damp the vibrations of the latter, the improvements comprising, a damper element supported from said housing, said damper element comprising an interface of a vibrational energy absorbing material, vibrational energy absorbing means pivotally supported from said interface whereby, vibrational energy from said body will be transmitted by, and under the vibrational energy absorbing restraint of, said interface to said vibrational energy absorbing means with attendant absorption of the thusly transmitted vibrational energy by the latter and damping of the vibrations of said body, and wherein said vibrational energy absorbing means comprise a rigid, generally elongate absorber arm extending from said damper element and having one end portion thereof pivotally supported from said interface, a vibration absorbing weight, and attachment means for attaching said weight to the other end portion of said absorber arm.

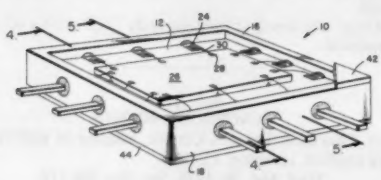


4,167,647

HYBRID MICROELECTRONIC CIRCUIT PACKAGE

Edmond A. Salera, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Continuation of Ser. No. 511,420, Oct. 2, 1974, abandoned. This application May 4, 1976, Ser. No. 683,128
Int. Cl.[2] H05K *5/06*
U.S. Cl. 174—52 FP **5 Claims**



1. A flat package for housing and supporting electronic devices or circuits or other electrical components in substantially parallel planes comprising:

(a) a substrate member having first and second substantially parallel and spaced-apart major surfaces lying in said parallel planes and with edges of a predefined contour and including a plurality of cavities spaced around said edges, said surfaces each adapted to receive a semiconductor die or other electrical component, and

(b) a plurality of lead connections securely mounted within said plurality of cavities, respectively, and having exposed connection surfaces also lying substantially in said parallel planes and accessible to both major surfaces of said substrate, whereby semiconductor dice or other electrical components mounted on each side of said substrate and in said parallel planes may share one or more of the plurality of electrical leads, thereby enhancing the vertical packing density of said package, and said lead connections also serve to conduct heat away from said substrate.

4,167,648

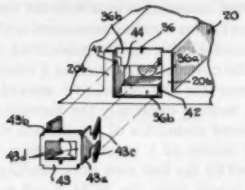
ELECTRIC JUNCTION BOX

Alan C. Lockwood, Rosemead, Calif., assignor to Norris Industries, Inc., Los Angeles, Calif.

Filed Oct. 18, 1977, Ser. No. 843,340
Int. Cl.[2] H02G *3/08*
U.S. Cl. 174—53 **6 Claims**

1. In an electrical junction box having a pair of oppositely positioned flat side walls, a pair of oppositely positioned end walls, a bottom wall and a substantially rectangular open top,

a substantially U-shaped post member formed along the inner surface of each of said end walls with the ends of the arms of the U's abutting against said end walls, on end of each of said post members extending to the top edge of the associated end wall, each of said post members having a bridging element running across said one end thereof, each of said bridging elements including a central apertured portion and bar portions on opposite sides of said apertured portion, said bar portions stepped upwardly



from said central portion to positions proximate to the top edge of the associated end wall, a pair of slots being formed between said central and bar portions and the arms of the "U" formed by said post member, said slots running substantially normal to said bar portions, and

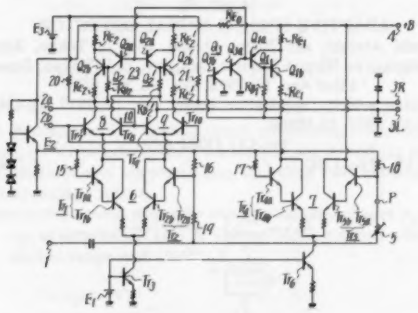
a fastener fitted into the bridging elements of each of said post members, each of said fasteners having a pair of side leg portions fitted into said slots and a face portion fitted over the central and bar portions of the bridging element.

4,167,649

CURRENT MIRROR CIRCUIT AND APPARATUS FOR USING SAME

Mitsuo Ohsawa, Fujisawa; Hiroshi Nakazawa, Kawagoe, and Hiroshi Yamagishi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 24, 1977, Ser. No. 827,381
Claims priority, application Japan, Aug. 24, 1976, 51-101019
Int. Cl.[2] H04R *5/04*
U.S. Cl. 179—1 GE **21 Claims**



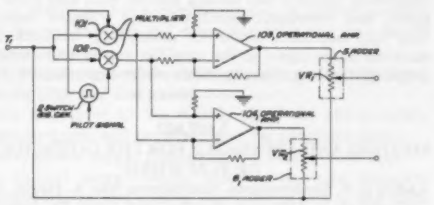
1. A current mirror circuit comprising a first transistor device having an input terminal and first and second output terminals, said first transistor device being formed of at least a pair of complementary transistors connected in Darlington-type configuration; a second transistor device having an input terminal and first and second output terminals, said second transistor device being formed of at least a pair of complementary transistors connected in Darlington-type configuration and having the input terminal thereof connected to said input terminal of said first transistor device; a third transistor device having an input terminal and first and second output terminals, said third transistor device being formed of at least a pair of transistors connected in Darlington-type configuration and having one of the output terminals thereof coupled to the input terminals of said first and second transistor devices; a first current output terminal coupled to one of the output terminals of said first transistor device; and a second current output terminal coupled to one of the output terminals of said second transistor device; and wherein the other output terminal of each of said first and second transistor devices is adapted to receive an operating voltage, said input terminal of said third transistor device is coupled to said first current output terminal, and the other output terminal of said third transistor device is coupled to a reference potential.

4,167,650

STEREO SIGNAL DEMODULATING CIRCUITS

Kazutoshi Kusano, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1978, Ser. No. 872,932
Claims priority, application Japan, Jan. 28, 1977, 52-8377
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—1 GE **7 Claims**



1. A demodulating circuit for deriving a first signal and a second signal from a composite signal comprising a resultant signal of the first and second signals, and a carrier-suppressed AM signal which is obtained by AM-modulation of a carrier with a difference signal of the first and second signals, which comprises:

first circuit means for making a switching signal having the same frequency as said carrier,

second circuit means for sampling said composite signal by said switching signal to provide two output signals including said first and second signals, respectively,

third circuit means for obtaining two difference signals between said two output signals from said second circuit means to provide a difference signal that the first signal is subtracted from the second signal and another difference signal that the second signal is subtracted from the first signal,

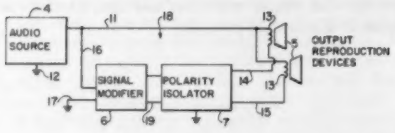
fourth circuit means for adding one of said difference signals from said third circuit means to said composite signal to provide the first signal, said fourth circuit means comprising a variable resistor means having an end terminal connected to a corresponding one of said two outputs of said third circuit means, an opposite end terminal coupled with said composite signal, and a sliding terminal from which the first signal is obtained,

and fifth circuit means for adding the other of said difference signals from said third circuit means to said composite signal to provide the second signal, said fifth circuit means comprising another variable resistor means having an end terminal connected to the other one of said two output of said third circuit means, an opposite end terminal coupled with said composite signal, and a sliding terminal from which the second signal is obtained.

4,167,651
MIXING TWO SIGNALS DERIVED FROM AN AUDIO SOURCE WITHOUT OSCILLATION

Robert B. Kempe, Janesville, Wis., assignor to O. C. Electronics, Inc., Milton, Wis.

Filed Sep. 20, 1977, Ser. No. 835,179
Int. Cl.[2] H04R 3/00
U.S. Cl. 179—1 J 10 Claims

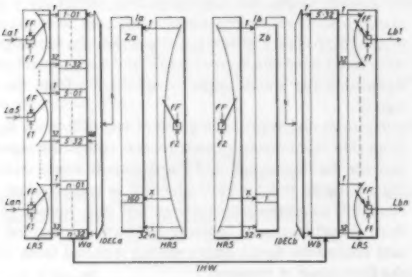


1. An audio system for reproducing reverberation effects from a mixture of two signals derived from an audio source supplying a basic audio signal, comprising in combination, a reproduction device having a pair of input terminals coupled to a signal responsive impedance member, amplifier means with low internal impedance applying the basic audio signal to one of said pair of the input terminals of the impedance member, reverberation means modifying the basic audio signal, and means applying the modified audio signal in opposite phase to the other of said pair of terminals for processing therein by said impedance member and mixing therein with said basic audio signal, said impedance member having a higher impedance than said amplifier, means for attenuating feedback of the modified audio signal to the amplifier means, and comprising primarily the impedance member of the reproduction device.

4,167,652
METHOD AND APPARATUS FOR THE INTERCHANGES OF PCM WORD

Anders E. S. Braugenhardt, Skärholmen; Nils A. Hedin, Älvsjö; Gustaf H. V. Odhelius, Handen, and Johan O. Änäs, Huddinge, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Continuation of Ser. No. 725,368, Sep. 22, 1976, abandoned, which is a continuation of Ser. No. 619,965, Oct. 6, 1975, abandoned. This application Jan. 13, 1978, Ser. No. 869,150
Claims priority, application Sweden, Oct. 17, 1974, 7413086
Int. Cl.[2] H04Q 11/04
U.S. Cl. 179—15 AT 4 Claims

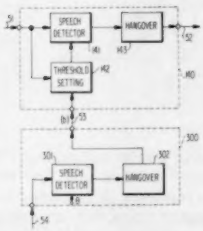


1. The method of integrated switching and transmission of PCM words which are incoming and outgoing on links each link having a plurality of channels, each channel being associated with a link time slot in a link frame, the switching being carried out by means of an interhighway bus acting as a common time multiplex connection on which the PCM words are transferred in bus time slots, the interhighway connected between inward traffic memory means, each associated with one incoming link, and outward traffic memory means, each associated with one outgoing link, each of said traffic memory means including a PCM word memory and an index number memory, respectively, said method comprising the steps of storing in corresponding locations of the index number memories of the respectively inward and outward memory means associated with an established connection in which the respective link is involved a channel index number associated with the incoming channel and a channel index number associated with the outgoing channel of the connection as well as a time index number which is the same for the respective inward and outward memory means, writing cyclically the incoming PCM words into the PCM word memories of the inward memory means, respectively, by means of a regular scanning occurring at a frequency defined by the link time slots, reading cyclically the outgoing PCM words from the PCM word memories of the outward memory means, reading cyclically the channel and the time index numbers from the index number memories by means of a regular scanning occurring at a frequency defined by index read out phases, each index read out phase comprising a number of the interhighway bus time slots and each interhighway bus frame including at least as many index read out phases as there are link time slots in a link frame, reading the PCM words from the PCM word memory into a buffer of the respective inward memory means in an irregular sequence determined by means of the channel index numbers read from the index number memory of said inward memory means, transferring the PCM words of an actual connection from the buffer of said respective inward memory means via the interhighway bus to a buffer of the respective outward memory means under the control of the time index number associated with the connection and read from the index number memories of said inward and outward memory means, and writing into the PCM word memory the PCM words from the buffer in the respective outward memory means in an irregular sequence determined by means of the channel index numbers read from the index memory of said outward memory arrangement.

4,167,653
ADAPTIVE SPEECH SIGNAL DETECTOR

Takashi Araseki, and Kazuo Ochiai, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Apr. 12, 1978, Ser. No. 895,561
Claims priority, application Japan, Apr. 15, 1977, 52-43841; May 12, 1977, 52-55068
Int. Cl.[2] H04J 6/00
U.S. Cl. 179—1 SC 2 Claims



1. An adaptive speech signal detector interposed in a 4-wire telephone channel for performing an adaptive threshold value setting operation depending on the channel noise level on a transmitter-side channel to detect a speech present at the transmitter, comprising: a first speech signal detector means having a transmission signal inputted thereto; an adaptive threshold value setting means having said transmission signal inputted

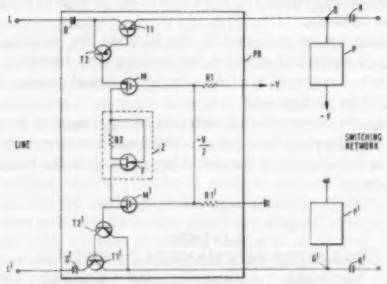
thereto for setting a threshold value for the speech signal detection as a function of said transmission signal and giving the set value to said first speech signal detector means; a first hangover circuit for extending the output signal of said first speech signal detector means by a first predetermined period of time; a second speech signal detector means having a reception signal inputted thereto; and a second hangover circuit for extending the output signal of said second speech signal detector means by a second predetermined period of time to inhibit the adaptive operation of said threshold value setting means when an output signal from said second hangover circuit is present.

4,167,654

TELEPHONE LINE FEEDING CIRCUIT INCLUDING A PROTECTIVE DEVICE

Daniel M. A. F. Bolus, Jovas Ponchartrain; Jean P. Chevillon, Plaisir; Jean C. Conte, Jouy-en-Josas, and Pierre D. P. Philippe, Clamart, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 28, 1978, Ser. No. 882,005
Claims priority, application France, Mar. 2, 1977, 77 06101
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—81 R **3 Claims**



1. A telephone line feeding circuit comprising: a d-c voltage source (−V) including means for feeding said dc voltage to the two wires of said telephone line, including two branches of said dc voltage source;

protective device means for maintaining the voltages v_Q and $v_{Q'}$ at terminals of said dc voltage feeding means within a limited range such that:

$$-V<v_Q<-V_S$$

$$-V_S<v_{Q'}<0$$

where V_S is a threshold voltage having a value approximately equal to V/2, said protective device means including:

two transistors coupled ahead of said dc voltage feeding means, in series with each of the two wires of said line respectively;

a high-impedance circuit connected by two MOS transistors to the bases of the two transistors, with the gates of the said MOS transistors having a fixed voltage −V/2;

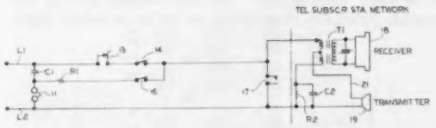
two protective diodes placed respectively in series with the two transistors.

4,167,655

PUSH BUTTON TO ROTARY DIAL CONVERTER SYSTEMS

Alfred M. Hestad, and Jan Synek, both of Chicago, Ill., assignors to United Networks Inc., Burbank, Ill.

Filed Oct. 17, 1977, Ser. No. 842,393
Int. Cl.[2] H04M *1/44*
U.S. Cl. 179—90 K **5 Claims**



4. A push button to rotary dial converter arrangement for converting push button telephones to provide rotary dial type pulsed outputs on telephone lines of telephone systems,

said arrangement comprising telephone subscriber set means including:

subscriber station network means;

hook switch means including one set of contacts in one of the at least two telephone lines connecting said network means to the telephone lines in the off hook condition;

a push button key pad having key means,

dial pulse generator means operated responsive to the operation of selected key means for producing desired numbers of dial pulses when said subscriber set means is in the off hook condition,

said dial pulse generator means providing a muting signal along with said dial pulses;

means responsive to the muting signal for electronically disconnecting said network from the telephone lines,

parallel power supply means across said telephone lines,

said parallel power supply means comprising capacitor means briding said lines on the network side of said hook switch means,

means for supplying power to said capacitor means, even when said hook switch means is in the on hook condition, and

bridge circuit means for maintaining the polarity on the telephone subscriber set means independent of polarity reversal of said telephone lines,

means for preventing speech attenuation by said bridge circuit means,

said subscriber set means including ringer means,

means bridging said ringer means including components of said bridge circuit means for preventing operation of said ringer means responsive to the dial pulses.

4,167,656

JUNCTOR CHECKING SYSTEM

Robert A. Durance, Richmond, and John A. Cribb, Ottawa, both of Canada, assignors to Mitel Corporation, Canada

Filed Aug. 14, 1978, Ser. No. 933,540
Claims priority, application Canada, Feb. 28, 1978, 297884
Int. Cl.[2] H04M *3/24;* H04Q *1/24*
U.S. Cl. 179—175.2 R **8 Claims**

1. A junctor checking system comprising:

(a) a first junctor for connection to a line circuit which has a low impedance to a common potential,

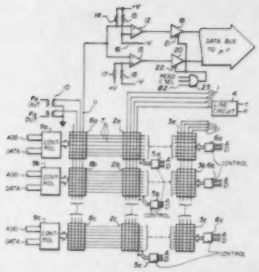
(b) a voltage level sensing circuit,

(c) means for connecting the voltage level sensing circuit to the junctor,

(d) a resistor connecting the input of the voltage level sensing circuit to a voltage source, and

(e) means for connecting the voltage level sensing circuit to

a further idle junctor in the event the voltage level sensed by the sensing circuit after connection to the first junctor



is closer to common potential than to the potential level of the voltage source.

4,167,657

KEYBOARD WITH MECHANICAL ENCODING

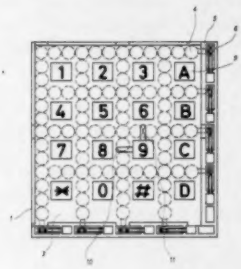
Alfred Zielke, Peine-Vöhrum, Fed. Rep. of Germany, assignor to ELMEG-Elektro-Mechanik Gesellschaft mit beschrankter Haftung, Peine, Fed. Rep. of Germany

Filed Mar. 3, 1978, Ser. No. 883,151

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1977, 2709227

Int. Cl.[2] H01H *9/26*

U.S. Cl. 200—5 EA **3 Claims**



1. In a keyboard having indivudally depressible keys arranged in an array further having a plurality of row channels and a plurality of column channels intersecting the row channels to establish an array of intersections, displacement bodies in the channels and provided for limited displacement therein, further having switching means adjacent one end each of at least some of the channels to be actuated upon displacement of the bodies in the respective channels, the keys each being provided with means for displacing the bodies in one row channel and in one column channel upon being depressed, the improvement comprising;

the channels each having bottom and sidewall portions of partial cylindrical contour concavely matching the contour of the bodies at least over a portion of the body in any plane through any of the bodies and extending transversely to the respective channel the body is in, said bottom and sidewall portion of each channel extending at least into and through any of the intersections of the channel resulting in the formation of sidewalls of declining height, whereby a pair of crossing arcs is defined in each intersection having an apex wherein the respective lowest bottom lines of the two intersecting channels intersect.

4,167,658

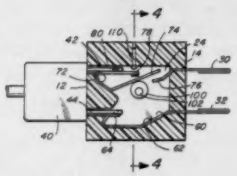
SAFETY AND SECURITY OUTLET

Robert S. Sherman, 28 McDonnell Dr., Randolph, Mass. 02368

Filed Mar. 20, 1978, Ser. No. 890,584

Int. Cl.[2] H01H *9/28, 13/70, 27/10*

U.S. Cl. 200—44 **9 Claims**



1. An electrical receptacle lock comprising

a housing having a chamber therein,

a pair of conducting prongs mounted on and extending from a wall of the housing and adapted to be inserted in an electrical outlet,

a pair of openings in another wall of the housing for receiving the prongs of a plug,

a first electrical contact in the housing electrically connected to one of the prongs mounted on the housing and positioned to be engaged by one of the prongs of the plug mounted in one of said openings,

a second electrical contact in the housing capable of engaging connecting and disconnecting to the other of the prongs mounted on the housing for electrical connection and disconnection of said contact and prong and positioned to be engaged by the other of the prongs of the plug in an opening,

switching means mounted in the housing for moving the second electrical contact for making and breaking the electrical connection of the second electrical contact with one of its prongs, and

latching means associated with one of the contacts for preventing the plug from being withdrawn from the openings in the housing when the switching means is in the breaking condition.

4,167,659

OPERATION MECHANISM OF SWITCH

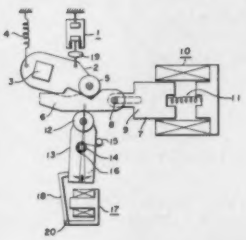
Takashi Yamanaka, Amagasaki, and Keikichi Kondo, Takarazuka, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1976, Ser. No. 755,942

Claims priority, application Japan, Jan. 6, 1976, 51/1026

Int. Cl.[2] H01H *3/00*

U.S. Cl. 200—153 E **6 Claims**



1. An operation mechanism of a switch which comprises a first slidable device connected to a moving electrode of the switch; a second slidable device faced to the first slidable device with a gap; and a wedge type element which is inserted

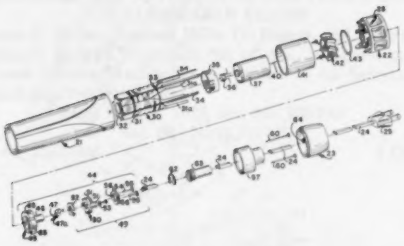
between both slidable devices to move the first slidable device depending upon the movement by a driving means and to move the moving electrode, whereby the electrode of the switch is turned on and off depending upon the movement of the wedge type element inserted between both of the slidable devices.

4,167,660

ROTATABLE CONTROL SWITCH FOR APPLIANCE

Ronald R. Liedtke, Addison, Ill., assignor to Shick Incorporated, Lancaster, Pa.

Filed Jan. 10, 1978, Ser. No. 868,404
Int. Cl.[2] H01H *19/28*
U.S. Cl. 200—155 R **26 Claims**



1. In an appliance operable in a digitally changeable first electric mode and a digitally changeable second electric mode, and having a body including an actuator rotatably mounted thereon, the rotation of said actuator controlling changes within each respective mode,

a control switch assembly adapted to be operatively connected to said actuator comprising:

a switch housing including a plurality of resilient first electrical contacts mounted thereon in spaced radial and angular relation around a central portion thereof;

a commutator assembly rotatably mounted on said housing in communication with said central portion thereof, said commutator assembly including a disc-shaped insulative base defining opposed surfaces having predetermined outlines, and a peripheral surface defined by said predetermined outlines including a plurality of detent portions positioned thereon which are adapted to engage said plurality of first electrical contacts in sliding contact therewith as said commutator is rotating on said housing, the engagement of said detents with said first contacts resisting the rotation of said base in said housing to define a plurality of discrete stop or operating positions for said switch, and

primary and secondary electrically conductive contact members mounted on at least one of said opposing surfaces of said disc, and extending radially outwardly relative said peripheral surface at designated positions therealong for connecting and disconnecting the chosen ones of said plurality of first contacts as said commutator assembly is rotated on said housing.

4,167,661

MICROWAVE OVEN

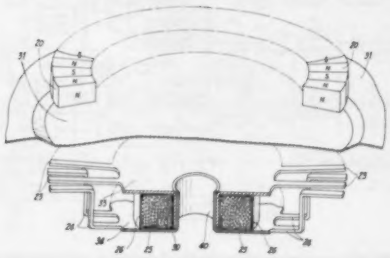
Masaru Ohkubo, Yamatokoriyama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 16, 1977, Ser. No. 769,302
Claims priority, application Japan, Feb. 20, 1976, 51/18121
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 F **3 Claims**

1. A microwave oven having an oven case, a microwave oscillator to feed a microwave electromagnetic field into a cooking chamber in said oven case, and a turning tray rotatably disposed on, and supported by, a bottom plate in said cooking chamber, characterized in that:

said turning tray comprises a plurality of N and S poles of permanent magnet alternately disposed in a first circle around the axis of rotation of the turning tray;

said oven case houses a plurality of poles of a stationary electromagnet disposed in a second circle and positioned on the opposite side of said bottom plate from the tray, said second circle having substantially the same diameter as the first circle and also being disposed about the axis of rotation of the turning tray, said poles of the electromagnet having substantially the same angular pitch as the angle between adjacent permanent magnets, adjacent



electromagnet poles generating alternating magnetic fields of opposite polarity independently of the position of the poles of the permanent magnet, the magnetic fields interacting with magnetic fields of said poles of the permanent magnet to revolve them and said tray around the axis; and

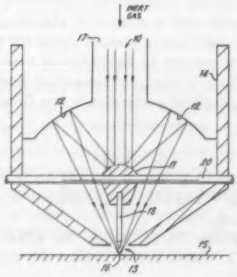
said bottom plate of said cooking chamber is substantially flat and solid thereby isolating the electromagnet in a watertight manner from the interior of the cooking chamber.

4,167,662

METHODS AND APPARATUS FOR CUTTING AND WELDING

William M. Steen, Teddington, England, assignor to National Research Development Corporation, London, England

Filed Mar. 27, 1978, Ser. No. 890,304
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 L **33 Claims**

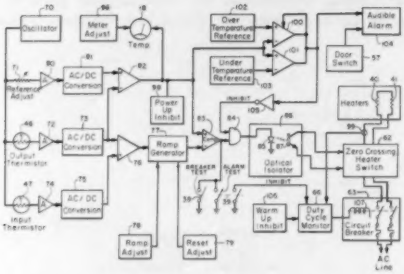


1. A method for treating workpiece means comprising one or more workpieces, including projecting a beam of light from a laser on to the workpiece means, striking an arc between, an electrode and the workpiece means, and maintaining the arc between the electrode and a heat affected zone created by the laser beam in the workpiece means, the laser beam an the arc existing concurrently for a substantial time in which workpiece treatment is carried out.

4,167,663
BLOOD WARMING APPARATUS

Daniel B. Granzow, Jr., Arlington Heights, and Robert J. Froehlich, Mt. Prospect, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jan. 24, 1977, Ser. No. 761,926
Int. Cl.[2] H05B 1/02
U.S. Cl. 219—497 26 Claims



1. Fluid warming apparatus for heating a refrigerated fluid such as blood to a predetermined nominal temperature prior to infusion at flow rates variable over a substantially predetermined range, said apparatus comprising, in combination:

housing means defining a heating chamber for the fluid within the apparatus, the fluid having an input temperature and an output temperature within said chamber;

at least one electric heater element operable from an applied electric current in thermal communication with the fluid in said heating chamber for heating the fluid as it passes through the apparatus;

control circuit means responsive to said input and output temperatures of the fluid for generating a heater control signal dependent on both said output temperature and flow rate of the fluid;

said control circuit means including first temperature sensing means for sensing the input temperature of the fluid and developing a first output signal indicative thereof, second temperature sensing means for sensing the output temperature of the fluid and developing a second output signal indicative thereof, a differential amplifier for developing from said first and second output signals a differential signal indicative of the differential between said input and output temperatures; said heater control signal being variable as a function of both said output temperature of the fluid and said differential signal; and

switch circuit means electrically connected between said heating element and a source of electrical current, and responsive to said heater control signal for controlling the application of current to said heating element, for maintaining the fluid at the predetermined nominal temperature notwithstanding variations in the flow rate thereof.

4,167,664
ADJUSTABLE READ HEAD ASSEMBLY

Raymond V. Pass, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

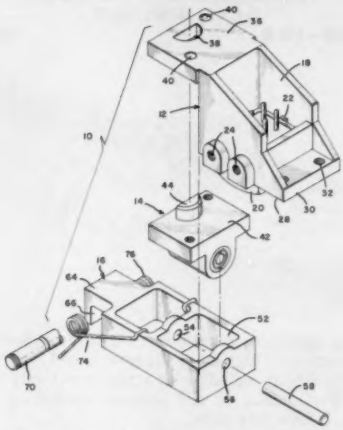
Filed Jan. 20, 1978, Ser. No. 871,070
Int. Cl.[2] G06K 7/08; G11B 5/56, 21/24
U.S. Cl. 235—449 6 Claims

1. An assembly for mounting a read-write head in a card reader and the like so as to accommodate for card irregularities without introducing erroneous data, said assembly comprising:

an elongated head carrying frame member having a central portion defining a read-write head receiving aperture, a mounting flange extending in a first direction from said central portion and an adjustment flange extending in the opposite direction from said central portion, means for mounting a read-write head in said aperture, a profiled aperture in said mounting flange and adjustment means in said adjustment flange;

an intermediate member having a mounting surface with a like profiled stud extending therefrom and received in said profiled aperture of said head carrying frame member, means to secure said mounting flange to said mounting surface, an axial passage, bearing means mounted in opposite ends of said passage; and

an elongated mounting frame member defining on one end thereof an aperture for receiving said intermediate member therein and a hooked extension on the opposite end, a

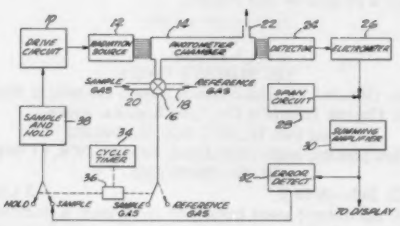


pair of aligned bores in opposite walls of said aperture, pivot pin means the ends of which are received in said bores in said mounting frame member and passing through said bearings to rotatably mount said intermediate member in said mounting frame member for movement about a first axis, and a hooked extension on the opposite end of said mounting frame members, said hooked extension engaging a mounting pin for rotational movement about an axis extending normal to said first axis, whereby said read-write head is mounted to float so as to accommodate irregularities in a card being read.

4,167,665
AUTOMATIC CALIBRATION CIRCUIT FOR GAS ANALYZERS

Robert K. Johns, West Covina; Owen M. Houston, Simi Valley, and Gene Frick, Los Angeles, all of Calif., assignors to Dasibi Environmental Corporation, Glendale, Calif.

Filed Oct. 31, 1977, Ser. No. 847,408
Int. Cl.[2] G01J 1/32; G01N 21/26; G05D 25/02
U.S. Cl. 250—205 7 Claims



1. An automatic calibration circuit for use with apparatus for measuring the concentration of a radiation-absorbing agent in a gas mixture, comprising

a radiation source arranged to irradiate a detector, amplifier means adapted for receipt of a signal from said detector,

error detecting means responsive to said amplifier means for providing an error signal, and

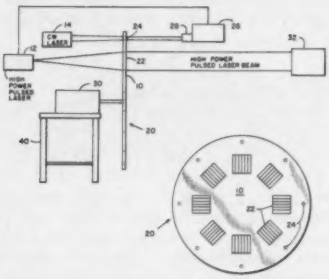
sample and hold means responsive to said error signal for varying the level of radiation emitted from said radiation source unit said error detecting means indicates a predetermined level, said sample and hold means including a digital-to-analog converter.

4,167,666

MULTI-GRATING ATTENUATOR FOR HIGH POWER PULSED LASER BEAMS

Thomas G. Miller, Auburn; Billie O. Rogers, and Thomas G. Roberts, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 28, 1978, Ser. No. 900,943
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—216 **3 Claims**



1. A multi-grating attenuator for high power pulsed laser beams comprising:

(a) a cw laser;

(b) a high power pulsed laser disposed for energization by said cw laser at predetermined intervals;

(c) multi-grating attenuator means disposed for attenuating the beam of said high power pulsed laser;

(d) means for synchronously aligning said attenuating means with said high power pulsed laser simultaneously with each pulse.

4,167,667

RESPIRATORY GAS MOISTURE SEPARATOR SYSTEM FOR MASS SPECTROMETER MONITORING SYSTEMS

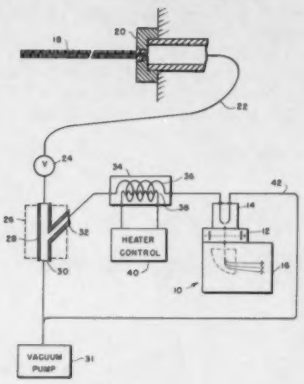
Lawrence G. Hall, Creve Coeur, Mo., and Ronald L. Runels, Ontario, Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 12, 1978, Ser. No. 915,044
Int. Cl.[2] B01D *59/44;* H01J *39/34*
U.S. Cl. 250—288 **7 Claims**

1. A system for reducing moisture content of a respiratory gas sample drawn into a capillary tube for transmission to a medical mass spectrometer for analysis, said system comprising:

pressure dropping means for rapidly dropping the pressure of the respiratory gas sample in said capillary tube to maintain contained moisture in a vapor state;

a momentum moisture separator located in the transmission tubing between said pressure dropping means and the medical mass spectrometer, said separator having an inlet, an outlet, and a tee connection intercepting the gas flow between inlet and outlet at an acute angle to said flow; and



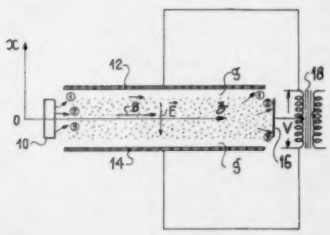
heating means coupled between said separator tee connection and the inlet leak of said mass spectrometer.

4,167,668

PROCESS AND APPARATUS FOR SEPARATING ISOTOPES

Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Sep. 6, 1977, Ser. No. 830,657
Claims priority, application France, Sep. 7, 1976, 76 26872
Int. Cl.[2] B01D *59/44*
U.S. Cl. 250—291 **4 Claims**



1. A process for separating two isotopes of a substance in which said isotopes are in very unequal proportions, comprising the steps of forming a plasma which contains the ions of said isotopes; applying a high frequency electric field and a perpendicular constant uniform magnetic field to said plasma, said electric field's frequency being for all practical purposes equal to the cyclotron frequency in the plasma of the ion of the least abundant isotope; including ions of a third type in the plasma, their proportion in the plasma being defined by the formula:

$$\frac{n_3}{n_2} = \frac{m_3}{m_2} \cdot \frac{\omega_{c1}^2 - \omega_{c3}^2}{\omega_{c2}^2 - \omega_{c1}^2}$$

where m, n, and ω designate respectively the mass, the number per unit of volume or concentration, and the cyclotron frequency of each type of ions in the plasma with the subscript 1 for the least abundant isotope, 2 for the other isotope and 3 for the said third type.

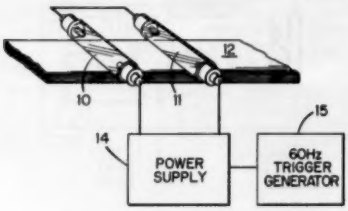
4,167,669
APPARATUS FOR RAPID CURING OF RESINOUS MATERIALS AND METHOD

C. Richard Panico, Medford, Mass., assignor to Xenon Corporation, Wilmington, Mass.

Continuation of Ser. No. 554,743, Mar. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 383,952, Jul. 30, 1973, which is a division of Ser. No. 178,936, Sep. 9, 1971, Pat. No. 3,782,889. This application Mar. 29, 1978, Ser. No. 891,079

Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—341 4 Claims



1. A method of operating flash apparatus for polymerizing thermosettable polymer systems comprising:

(a) placing a flashhead containing at least one flash lamp facing a polymer system to be polymerized;

(b) driving said flash lamp with capacitive discharge pulses having a pulse width in the range of one millisecond to one microsecond and a repetition rate in the range of three to one hundred twenty pulses per second; and,

(c) applying an energy level to said pulses such as to provide a temperature measured adjacent the surface of said polymer system of substantially 430° C., said at least one flash lamp is selected and driven to provide maximum energy peaks in the 400 to 500 nanometer wavelength region while simultaneously providing secondary peaks in the 800 to 900 nanometer wavelength region such that at least 25% of the energy output is in the 800 to 1000 nanometer wavelength region.

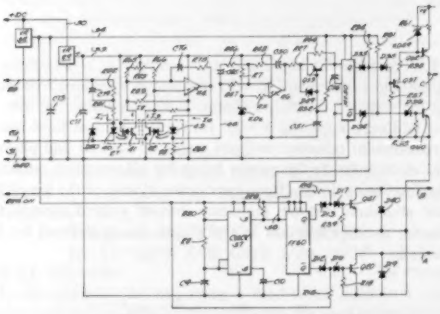
4,167,670
DENTAL X-RAY APPARATUS

Raymond W. Ingold, Muskego, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 3, 1978, Ser. No. 874,779

Int. Cl.[2] H05G *1/00*

U.S. Cl. 250—402 9 Claims



1. Dental x-ray apparatus comprising a housing, an x-ray tube having an anode and a cathode filament disposed in said housing for projecting x-radiation therefrom, a step-up transformer in said housing having a primary winding and at least a pair of secondary windings and a loop circuit connecting said secondary windings in series, rectifier means in said housing, having input means coupled with said secondary windings and d-c output terminals to which said anode and cathode of said tube are connected, respectively, a low voltage filament transformer in said housing having its secondary winding connected for energizing said filament and having a primary winding, and an improved power supply for said x-ray tube including:

a. a-c to d-c converter means having input means for coupling to an a-c power line and having d-c output terminals, said converter means being operative to provide to its output terminals a first d-c voltage which is constant and below a predetermined desired voltage,

b. d-c storage means having input and output means,

c. means for adding on an increment of d-c voltage to said first d-c voltage from said converter output means and for supplying the sum of said increment and said first d-c voltages to said d-c storage means,

d. inverter means having input and output means, said input means being supplied from said d-c storage means output terminals, said output means of said inverter means being coupled to said primary winding of the step-up transformer, said inverter means being operative to convert d-c power to a-c power, and

e. means for sensing the voltage on said storage means, and means responding to the sensed voltage by controlling said means for adding on said voltage increment to add on an increment that results in said predetermined voltage being developed on said storage means.

4,167,671
ROTARY ANODE X-RAY TUBE

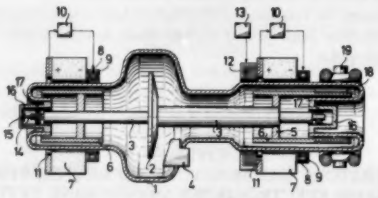
Karl Boden, Julich; Johan K. Fremerey, Bonn; George Comsa, Julich-Stetternich; Friedrich Gudden, Spardorf; Gunther Appelt, Erlangen; Rudolf Friedel, Kleinseebach, and Ernst Geldner, Rosstal, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich and Siemens Aktiengesellschaft, Munich, both of, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,769

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1977, 2716079

Int. Cl.[2] H05G *1/70*

U.S. Cl. 250—406 11 Claims



1. A rotary-anode X-ray tube comprising:

an evacuated envelope;

a rotary anode in said envelope mounted on a drive shaft that is held magnetically in a contactless bearing, said rotary anode being located in said envelope in a manner allowing high temperature radiation cooling thereof;

a cathode in said envelope opposite a portion of said rotary anode;

an electrical slip contact in said envelope for supplying anode voltage for said rotary anode, and

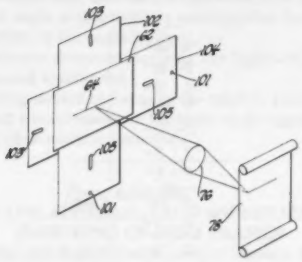
electromagnetically operated means for producing relative movement of said contact and of said anode together with its drive shaft for controlling the time at and during which anode voltage is supplied to said rotary anode through said contact.

4,167,672

METHOD AND APPARATUS FOR DEMONSTRATION OF ARBITRARY SURFACES WITH DYNAMIC TOMOGRAPHY

Albert G. Richards, 395 Rock Creek Dr., Ann Arbor, Mich. 48104

Filed Jan. 23, 1978, Ser. No. 871,287
Int. Cl.[2] G03B 41/16
U.S. Cl. 250—445 T 15 Claims



1. A method for producing an image of a surface of arbitrary shape and orientation within a body from a set of tomographic records taken from a radiographic examination of the body, the method comprising the steps of:

(a) superimposing the set of tomographic records in overlying relation with one another;

(b) shifting each of the tomographic records with respect to one another to bring into virtual focus a continuous succession of laminar images through the depth of the body; and

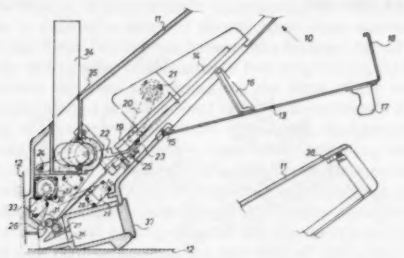
(c) selecting a predetermined portion of each of the focused laminar images that represents the intersection of the body surface to be produced with the image of the lamina in focus, whereby the arbitrary surface is produced by the continuous succession of focusing of laminae through the depth of the body.

4,167,673

SHEET SQUARING DEVICE

Emile F. Stievenart, Hoboken; Hendrik S. Piessers, Boechout, and Georges J. Neujens, Merksem, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 743,172, Nov. 19, 1976, abandoned. This application Jan. 18, 1978, Ser. No. 870,364
Claims priority, application United Kingdom, Nov. 20, 1975, 47808/75
Int. Cl.[2] G11B 1/04; B65H 1/00, 9/06
U.S. Cl. 250—468 3 Claims



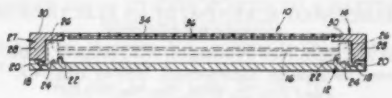
1. Unloading apparatus for a radiographic film sheet cassette which comprises means for locating in a predetermined unloading position a cassette loaded with a film sheet, said cassette having an open and a closed mode and including latching means for keeping the cassette fastened when in said closed mode, a mechanism for unfastening said latching means and opening the cassette when in said unloading position, a cooperating pair of normally stationary feed rollers adapted when rotatably driven in a given direction to feed the sheet between them and to a delivery point, means forming an uninterrupted film sheet pathway which begins adjacent said cassette unloading position and slopes downwardly towards and terminates adjacent the nip of said feed rollers, means for causing transfer of a film sheet from the open cassette onto such pathway, driving means operative when actuated to drive said feed rollers in said feeding direction, and means on said pathway at a point spaced upstream from said feed rollers for detecting the passage of said sheet by said point and for automatically activating said driving means in response to said detection to commence delivery of the film sheet by said feed rollers only after passage of a predetermined interval of time, said pathway having a length and inclination which is sufficient to cause a film sheet transferred thereto from said open cassette to descend freely therealong under force of gravity and to acquire by the time said descending sheet impacts against the nip of said pair of normally stationary feed rollers a momentum which is sufficient in the event said sheet is in skewed condition upon arrival at said roller nip to become squared with respect to said pathway under the turning movement created by its own momentum, said predetermined interval of time being sufficiently great to permit the leading edge of said descending sheet to reach said roller nip and to undergo said turning movement.

4,167,674

PHOTORECEPTOR PLATE CASSETTE FOR USE IN AUTOMATED X-RAY IMAGE PROCESSING SYSTEMS

Paul G. Koontz, Granada Hills; Richard L. Wright, Canoga Park, and Arthur M. Cantu, Thousand Oaks, all of Calif., assignors to Hipoint Research, Inc., Van Nuys, Calif.

Continuation-in-part of Ser. No. 807,112, Jun. 16, 1977. This application Aug. 1, 1977, Ser. No. 820,598
Int. Cl.[2] G03B 41/16; G03G 15/00
U.S. Cl. 250—481 8 Claims



1. In a cassette adapted to receive a photoreceptor plate and adapted for use in an automated x-ray image processing system, said cassette being comprised of a base member for supporting said photoreceptor plate, and a top cover rotatably hinged to the base member for enclosing said photoreceptor plate in a light-impenetrable environment, the improvement which comprises:

said top cover including a thin highly x-ray transparent light-impenetrable window member attached thereto formed of a composite material comprised of powdered carbon and a fibrous material selected from the group consisting of carbon filaments, synthetic organic fibers and both carbon filaments and synthetic organic fibers held in a cured matrix of a thermosetting resin.

4,167,675

X-RAY COLLIMATOR COMPRISING LIGHT BEAM LOCALIZER WITH LENS SYSTEM

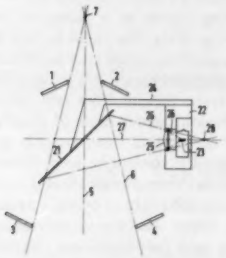
Lars Stödberg, Stenhamra, and Hans Sjöström, Spanga, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 8, 1977, Ser. No. 804,536

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1976, 2623213

Int. Cl.[2] A61B *6/08*

U.S. Cl. 250—491 **3 Claims**



1. An x-ray collimator comprising at least two pairs of collimator plates, staggered 90°, wherein the plates of each pair of collimator plates are commonly adjustable symmetrically to the longitudinal axis of the collimator, and comprising a light beam localizer for the purpose of rendering visible the collimated field, including a light source which produces a light beam bounded by the collimator plates, characterized in that there is arranged directly before the light source and in the radiation path of said light source, an optical lens system for the purpose of concentrating its radiation and for the purpose of amplifying the radiation intensity of said light beam, and wherein two pairs of collimator plates, staggered 90°, lie close-to-focus when the collimator is mounted onto an x-ray tube housing, and wherein two additional pairs of collimator plates, also staggered 90°, lie remote-from-focus when the collimator is installed, and wherein all plates are adjustable such that, in the installed state, the collimated pyramid has its apex lying at the focus of the x-ray tube, characterized in that a mirror is arranged between the close-to-focus and the remote-from-focus pairs of collimator plates, said mirror being arranged diagonally at an angle of approximately 45° relative to the longitudinal axis of the collimator, the light source with its optical lens system being so aligned to said mirror that the central light ray runs approximately perpendicularly to the collimator longitudinal axis.

4,167,676

VARIABLE-SPOT SCANNING IN AN ELECTRON BEAM EXPOSURE SYSTEM

Robert J. Collier, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 21, 1978, Ser. No. 879,097

Int. Cl.[2] A61K *27/02*

U.S. Cl. 250—492 A **16 Claims**

1. Apparatus for fabricating microminiature devices by selectively irradiating a radiation-sensitive layer (**10**) with a variable-spot-size radiant beam to define a pattern in said layer, said apparatus comprising

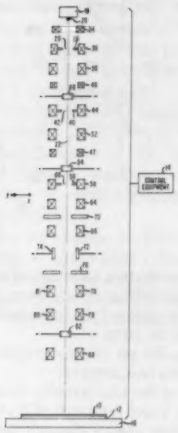
first and second mask plates (**26, 40**) spaced apart from each other along a main longitudinal axis (**22**) or said apparatus and each having an aperture configuration therethrough,

means (**18**) for directing a radiant beam at said first mask plate (**26**) to illuminate its aperture configuration (**28**) in its entirety,

means (**48**) for selectively deflecting the image of the beam transmitted through the aperture configuration (**28**) in said first mask plate (**26**) to control the alignment of said image with respect to the aperture configuration (**42**) in said second mask plate (**40**) thereby to vary the cross-sectional area of the beam transmitted through said second mask plate,

characterized in that said apparatus further comprises a third mask plate (**56**) spaced apart from said second mask plate (**40**) along said axis (**22**),

means interposed between said second and third mask plates for focusing onto said third mask plate the image of the beam that appears in the plane of said second mask plate and that is transmitted through said second mask plate to



form an image on said third mask plate of the cross-sectional area of the beam transmitted through said second mask plate,

and means (**54**) for selectively deflecting the image of the beam transmitted through the aperture configuration (**42**) in said second mask plate (**40**) to control the alignment of said image with respect to the aperture configuration (**60**) in said third mask plate (**56**) thereby to vary the cross-sectional area of the beam transmitted through said third mask plate toward said radiation-sensitive layer (**10**).

4,167,677

OPTICAL DEVICE FOR THE ALIGNMENT OF TWO SUPERIMPOSED OBJECTS

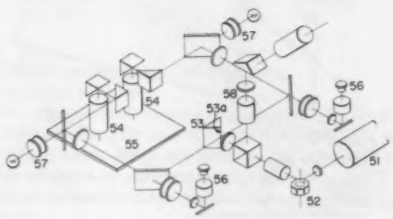
Akiyoshi Suzki, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 17, 1978, Ser. No. 870,089

Claims priority, application Japan, Jan. 21, 1977, 52-5502

Int. Cl.[2] G01N *21/30*

U.S. Cl. 356—401 **6 Claims**



1. An optical device comprising:

a light source for producing a stationary beam;

a scan optical system for converting said stationary beam to a moving spot on a scanning surface;

a substance placed on the scanning surface, the substance

having first and second marks to be scanned by said moving spot, the first mark comprising four bars, the first and second bars and the third and fourth bars being parallel, respectively, with a predetermined distance, therebetween the first and second bars including their extensions and the third and fourth bars including their extensions crossing at a predetermined angle, and said second mark comprising fifth and sixth bars, the fifth and sixth bars including respective extensions crossing at a predetermined angle, and the first through sixth bars crossing at a desired angle, respectively, a scanning line formed by the movement of the scanning spot;

a photoelectric detector receiving the lights from said first and second marks; and

a computing device to measure the relative positions of the first and second marks on the basis of the signals detected by the photoelectric detector.

4,167,678

METHOD AND APPARATUS FOR ASCERTAINING THE POSITIONS OF FILM FRAMES

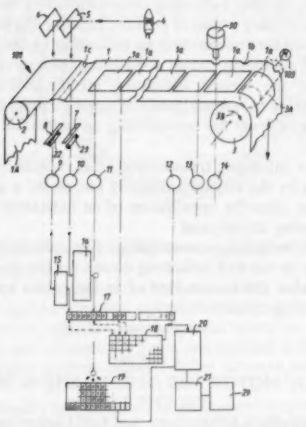
Klaus Mischo, and Rudolf Paulus, both of Munich, Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 877,827

Claims priority, application Fed. Rep. of Germany, Feb. 8, 1977, 2705097

Int. Cl.[2] G01N *21/30*

U.S. Cl. 250—559 **15 Claims**



1. A method of automatically ascertaining the locations of frames in each of a series of photographic films wherein a transverse frame line extends between the leading edge of one and the trailing edge of the other of two neighboring frames, comprising the steps of transporting the films of the series lengthwise along a predetermined path; photoelectrically monitoring, in a predetermined portion of said path, the light transmissivity of successive narrow transversely extending increments of each film and generating signals whose characteristics denote the transmissivity of the respective increments whereby such characteristics normally change appreciably during transport of leading and trailing edges of said frames past said portion of said path; measuring, for each film of said series, the length of at least one frame whose leading and trailing edges have initiated accurately detectable changes in the characteristics of said signals; and utilizing the measured length as a criterion for determination of the location of those film frames and those edges of film frames forming part of the respective film which failed to initiate appreciable changes in the characteristics of said signals and/or for determination whether two successively detected edges from part of one and the same film frame.

4,167,679

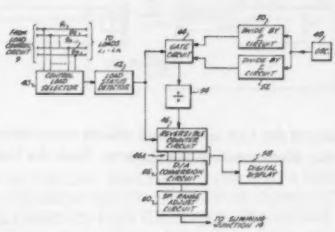
FLOATING SET POINT CONTROL CIRCUIT AND METHOD FOR USE WITH ELECTRICAL LOAD CONTROL SYSTEMS

Warren L. Leyde, Seattle, and Don R. Hall, Edmonds, both of Wash., assignors to Pacific Technology, Inc., Renton, Wash.

Filed Apr. 3, 1978, Ser. No. 893,018

Int. Cl.[2] H02J *4/00*

U.S. Cl. 307—35 **36 Claims**



8. For use with an electrical load control system operative to turn on and off selected ones of a plurality of loads in response to deviation of the actual rate of power being consumed by the plurality of loads from a set point representing a desired rate of power consumption, the electrical load control system including means for establishing the set point at a fixed value thereof, an improvement comprising a set point control means which acts to optimize energy usage by the plurality of loads during times of low power consumption, said set point control means comprising:

(a) first means detecting whether a control load, comprising one of the plurality of loads, is in an on state or in an off state;

(b) second means responsive to said first means for causing the set point to decrease at a first predetermined rate toward but not less than a predetermined, minimum value; and

(c) third means responsive to said first means for causing the set point to increase at a second predetermined rate toward but not greater than the fixed value, said second predetermined rate being much greater than said first predetermined rate.

4,167,680

EMERGENCY STANDBY SYSTEM FOR AUTOMATIC TRANSFER FROM UTILITY POWER TO A BATTERY POWERED SYSTEM

Ronald D. Gross, Wyoming, N.Y., assignor to Chloride Electro Networks, Tampa, Fla.

Filed May 13, 1977, Ser. No. 796,712

Int. Cl.[2] H02J *9/00*

U.S. Cl. 307—66 **7 Claims**

1. A standby power supply system for connecting an inverter to supply a given load upon interruption of normal A.C. utility service, comprising:

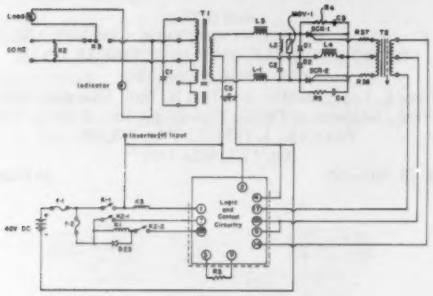
an SCR inverter having first and second silicon controlled rectifiers for deriving alternating current from a battery,

logic control means to control the operation of the inverter, having:

means connected to the inverter to cause the first SCR to be operative for a full one-half cycle before commutating the second SCR on,

means connected to the inverter to cause the battery to be connected thereto prior to the application of gate drives to the gates of the first and second silicon controlled rectifiers when the inverter is initially connected to

supply the load, and to disconnect the battery from the inverter prior to the removal of the gate drives from the



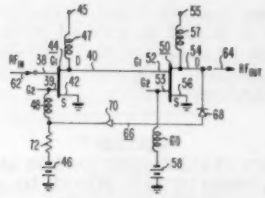
gates of the first and second silicon controlled rectifiers when disconnecting the inverter from the load.

4,167,681

MICROWAVE POWER LIMITER COMPRISING A DUAL-GATE FET

Herbert J. Wolkstein, Livingston; Arye Rosen, Cherry Hill, and Jitendra Goel, Kendall Park, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,720
Int. Cl.[2] H03G *11/04;* H04B *3/04*
U.S. Cl. 307—237 **5 Claims**



1. A power limiter for generating an output RF signal of substantially constant power level in response to an input RF signal of varying power level, comprising:

a field effect type transistor having first and second gate, drain and source electrodes, said first gate electrode being receptive of said input RF signal;

means for biasing said second gate electrode of said transistor such that said transistor operates in a gain region characterized by a power curve having a slope whose change in output power is substantially equal to or greater than the change in input power, and a saturation region characterized by a power curve having a compression slope whose change in output power is substantially less than the change in input power, such that the final output power variation is small compared to the input power variation,

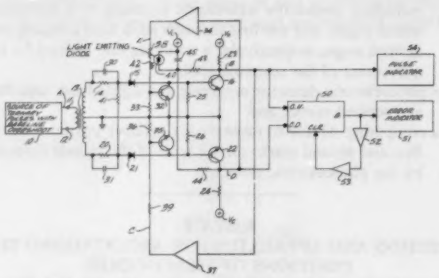
said substantially constant output RF signal being generated over said saturation region.

4,167,682

OVERSHOOT SUPPRESSION CIRCUITRY FOR TERNARY PULSES

Orrin B. O'Dea, Garden Grove, Calif., assignor to Communication Manufacturing Co., Long Beach, Calif.

Filed Nov. 3, 1977, Ser. No. 848,267
Int. Cl.[2] H03K *5/08, 5/18*
U.S. Cl. 307—237 **17 Claims**



1. A system for suppressing overshoot comprising:

a source of ternary pulses subject to baseline overshoot above a threshold level for less than a given period of time after termination of each pulse;

load means for detecting the occurrence of successive ternary pulses of the same polarity;

a first indicating circuit connecting the source to the load means, the first indicating circuit including means responsive to ternary pulses of positive polarity above the threshold level for transmitting an indication to the load means;

a second indicating circuit connecting the source to the load means, the second indicating circuit including means responsive to ternary pulses of negative polarity above the threshold level for transmitting an indication to the load means;

means for inhibiting transmission of an indication to the load means by the second indicating circuit for a given period of time after the termination of an indication by the first indicating circuit; and

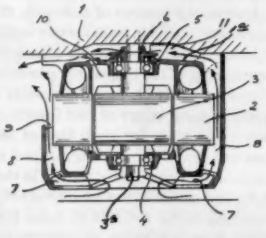
means for inhibiting transmission of an indication to the load means by the first indicating circuit for the given period of time after the termination of an indication by the second indicating circuit.

4,167,683

ELECTRIC MOTOR FOR DISH WASHING MACHINES OR THE LIKE

Stig L. Hallerbäck, Göthenburg, and Leif Lachonius, Surte, both of Sweden, assignors to Aktiebolaget SKF, Gothenburg, Sweden

Filed Aug. 29, 1977, Ser. No. 828,899
Claims priority, application Sweden, Oct. 6, 1976, 7611054
Int. Cl.[2] H02K *9/06*
U.S. Cl. 310—63 **4 Claims**



1. An electric motor assembly comprising a casing adapted

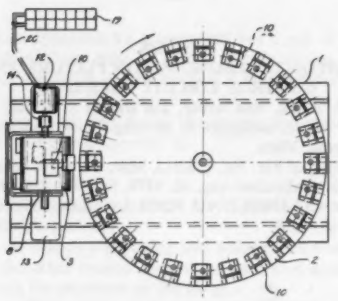
to be mounted at one axial end to a frame of a machine, a stator mounted in said casing and spaced therefrom including means defining circumferentially spaced, axial air channels circumscribing said stator, a rotor including a shaft journalled in bearings at opposite ends of said stator, a blower mounted on the free end of said rotor shaft remote from said frame operable to circulate cooling air through said channels, means defining outlet openings for some of said channels spaced axially from said frame at one side of the motor, said other channels being closed in an axial direction adjacent said frame so that air is directed radially towards said shaft at said one axial end, an end wall at one axial end of the motor spaced from the frame and at least one pair guide vanes projecting from said end wall toward the frame for guiding air flow from said other axial channels and directing it radially over in the space between said end wall and frame over the central portion of the end wall.

4,167,684

MAGNETIC TORQUE MULTIPLIER

Donald A. Kelly, 58-06 69th Pl., Maspeth, New York, N.Y. 11378

Filed Dec. 15, 1977, Ser. No. 860,689
Int. Cl.[2] H02K *7/06*
U.S. Cl. 310—80 **10 Claims**



1. A magnetic torque multiplier comprised of two basic rotating components,

a large flat non-magnetic wheel containing two series of equally spaced identical permanent magnets arrayed on each face of said flat non-magnetic wheel so that their opposite sets of common poles are exposed at the periphery, a slight uniform angular offset between each of said two

series of equally spaced identical permanent magnets around the circumference of said large flat non-magnetic wheel,

a driving cylindrical non-magnetic rotor containing multiple identical equally spaced permanent magnets arrayed so that their common poles are exposed as a single pitch helical path on the peripheral surface of said driving cylindrical non-magnetic rotor,

arrangement of said large flat non-magnetic wheel and said driving cylindrical non-magnetic rotor on a common centerline with the rotating shaft axes at a right angle to each other,

support means for said large flat non-magnetic wheel including an elongate base and shaft with ball bearings,

support means for said driving cylindrical non-magnetic rotor comprised of support brackets and shaft with two ball bearings, securing of said support brackets onto said elongate base,

securing and locking means for each of said equally spaced identical permanent magnets onto said large flat non-magnetic wheel and said driving cylindrical non-magnetic rotor,

electric motor drive means for the shaft of said driving-cylindrical non-magnetic rotor, a coupling securing said electric motor drive means to said shaft of said driving cylindrical non-magnetic rotor,

an alternator coupled to said shaft of said large flat non-magnetic wheel,

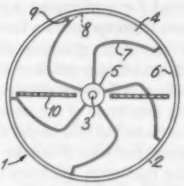
multiple solar photovoltaic cells remotely connected to said electric motor drive means, connection of said multiple solar photovoltaic cells to said electric motor drive means with suitable multiple electric conduction wires.

4,167,685

ELECTRICAL MACHINE COMMUTATOR ARRANGEMENT HAVING SHAPED CONDUCTIVE SEGMENTS FOR REDUCED SPARKING

James J. Bates, Shrivenham, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 583,401, Jun. 3, 1975, abandoned. This application May 31, 1977, Ser. No. 801,996
Claims priority, application United Kingdom, Jun. 10, 1974, 25623/74
Int. Cl.[2] H02K *13/04*
U.S. Cl. 310—237 **8 Claims**



1. A rotatable commutator comprising:

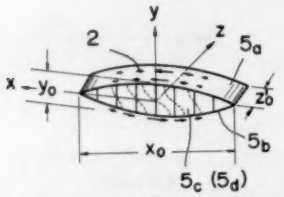
a plurality of conductive segments separated from one another by insulating boundaries, at least one elongated rectangular brush extending in a direction normal to the direction of rotation of the commutator, said brush uniformly bearing on said segments and arranged such that said brush at no time contacts more than two segments simultaneously, and inductance means interconnecting adjacent segments, said inductance means having an inductive time constant during commutation which is at least substantially comparable to the time required for said brush to pass from a given position on one of said segments to a corresponding position on an adjacent one of said segments as the commutator rotates in a predetermined direction, each said insulating boundary having a first boundary portion extending in a direction normal to the direction of commutator rotation and a second boundary portion departing from the direction of said first boundary portion and extending to a point angularly displaced from the direction of said first boundary portion whereby said commutator rotation brings said brush into contact with said adjacent segment initially by passing over the first boundary portion to increase the area of contact between said brush and said adjacent segment in a substantially stepwise manner and subsequently by passing over the second boundary portion to increase said area of contact at a mean rate which progressively declines.

4,167,686

MINIATURIZED AT-CUT PIEZOELECTRIC CRYSTAL RESONATOR

Hitohiro Fukuyo, 19-2, Yoyogi 2-chome, Shibuya-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 700,237, Jun. 28, 1976, abandoned, which is a continuation of Ser. No. 535,745, Dec. 23, 1974, abandoned. This application Feb. 3, 1978, Ser. No. 875,040
Claims priority, application Japan, Dec. 21, 1973, 48-142422
Int. Cl.[2] H01L *41/18*
U.S. Cl. 310—361 **12 Claims**



1. An AT-cut piezoelectric crystal resonator comprising a plurality of contoured surfaces, two of said contoured surfaces being generated by translating contour lines parallel to the z-axis and perpendicular to the electric axis or x-axis, at least one of the said two surfaces being convex, and another two contoured surfaces being perpendicular to said z-axis and spaced apart by a length dimension z'_0 which is 0.1 to 1.3, preferably 0.3 to 1.0, of the maximum thickness dimension y_0 representing the distance between the first said two surfaces and measured along a line perpendicular to the said x-axis, said resonator being adapted for performing a mode of vibration along the said thickness forming either a fundamental standing wave or an overtone thereof of a thickness-shear vibration, the free ends of said vibration being positioned at the first said two surfaces, the amplitude of vibratory displacements appearing along said x-axis being maximum at the center of each surface of the first said two surfaces, the said center being the midpoint of a length taken along the said x-axis or the dimension x_0 which is 3 to 15 of the maximum thickness dimension y_0, and constituting the span of arc of the said convex surface, said amplitude becoming null at a point on each of the first said two surfaces where the said point approaches each end of the convex line generating said convex surface, and the distribution of the said amplitude being uniform on any point taken along the said length of the said z'_0 dimension on each of the first said two surfaces.

4,167,687

SMOKE DETECTOR APPARATUS AND IONIZATION CHAMBER THEREFOR

Douglas E. Furney, Golden, Colo., assignor to Unitec, Inc., Englewood, Colo.

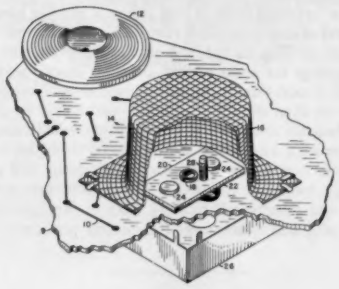
Filed Feb. 10, 1977, Ser. No. 767,582
Int. Cl.[2] G01N *23/12*
U.S. Cl. 313—54 **11 Claims**

1. An ionization chamber for a combustion product indicating apparatus, said ionization chamber comprising:

a wire mesh collector at least partially forming the walls of said chamber and providing a first electrode;

electrically nonconductive mounting means forming the remainder of the walls of said chamber and having said wire mesh collector fastened thereto;

a second electrode having at least a portion within said chamber formed by said wire mesh collector and said mounting means with said second electrode being spaced from said wire mesh collector; and



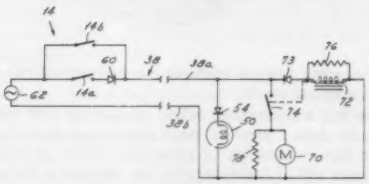
a radioactive source mounted on said mounting means and spaced from said wire mesh collector with said source emitting alpha particles into said chamber.

4,167,688

COMPOSITE ILLUMINATION FIXTURE AND CONTROL CIRCUIT THEREFOR

Michael J. Burek, Ann Arbor, and Robert S. White, Livonia, both of Mich., assignors to Stirling-White Company, Inc., Farmington, Mich.

Continuation of Ser. No. 778,012, Mar. 16, 1977, abandoned. This application Aug. 30, 1978, Ser. No. 938,082
Int. Cl.[2] H05B *37/02*; F24H *3/02*; G08B *17/10*
U.S. Cl. 315—178 **15 Claims**



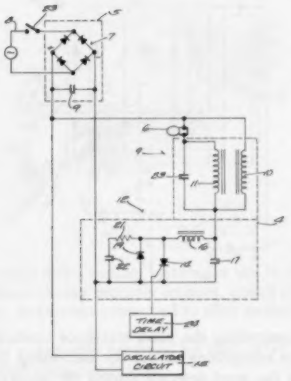
1. In an a-c utility power system, the combination comprising two electrically powered apparatus disposed at one location, at least one of said apparatus being adapted to be powered by full-wave a-c power, a two-conductor utility power cable, means operatively connecting the first and second power conductors of said cable to each said apparatus at said one location such that said first and second power conductors provide the only source of utility power to said apparatus, and switch means located remotely of said apparatus at a second location and connected to said conductors for applying a-c power to said conductors and said apparatus, said switch means comprising a switch having an open and a closed condition and means connected across said switch for applying continuous first a-c power to said conductors and said apparatus independently of said switch, said switch in said closed condition supplying second a-c power comprising full-wave a-c power to said conductors and said apparatus, said connecting means including first means at said one location responsive to said continuous first a-c power for applying said continuous power to a first of said apparatus and second means at said one location responsive only to said second a-c power for applying full-wave power to said at least one apparatus comprising said second apparatus.

4,167,689

SOLID STATE LAMP BALLAST

Patric C. Quirke, Whitewater, Wis., assignor to Whitewater Electronics, Inc., Whitewater, Wis.

Filed Jul. 21, 1978, Ser. No. 926,938
Int. Cl.[2] H05B *41/26*
U.S. Cl. 315—206 19 Claims



1. Ballast apparatus for a lamp that has a pair of terminals across which there must be a high voltage during a starting period but for which current limiting is required during subsequent operation, when impedance across said terminals is substantially lower than during the starting period, said ballast apparatus being characterized by:

A. a load coil;

B. a voltage coil;

C. means connecting said coils in a regulating circuit having parallel branches,

(1) one branch comprising said voltage coil and

(2) the other branch comprising said load coil in series with the terminals of the lamp;

D. a capacitor connected with said regulating circuit for impressing an alternating voltage across the voltage coil in consequence of the capacitor being alternately charged and discharged; and

E. means comprising solid state switching means connected with the voltage coil, the capacitor and a source of direct current, for alternately charging and discharging the capacitor at a frequency of several KHz.

4,167,690

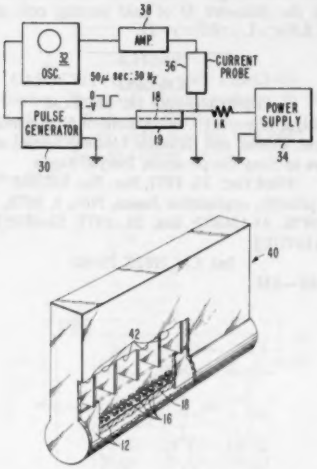
CATHODE AND METHOD OF OPERATING THE SAME

Robert A. Gange, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 2, 1977, Ser. No. 792,569
Int. Cl.[2] H01J *29/70, 29/72*
U.S. Cl. 315—366 16 Claims

1. A method of operating a directly heated line cathode, comprising the steps of:

(a) providing said cathode with a plurality of discrete heating current pulses therethrough with a predetermined time period separating consecutive ones of said discrete heating pulses; and



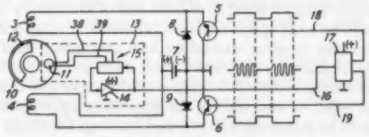
(b) extracting current from said cathode during at least a portion of said predetermined time period.

4,167,691

CONTROL ARRANGEMENT FOR A BRUSHLESS MOTOR

Frode Sorensen, Sonderborg; Hans K. Pedersen, Nordborg; Hyldal Jorgen, Nordborg, and Benny Strandtoft, Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jan. 20, 1978, Ser. No. 870,992
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702190
Int. Cl.[2] H02K *29/00*
U.S. Cl. 318—138 1 Claim



1. A control arrangement for a brushless motor having a permanent magnet rotor and stator windings, comprising, a voltage source, a sensing coil in fixed relation to said stator for detecting the rotary position of said rotor, controllable electronic switches in respective series with said stator windings and said voltage source for controlling the current flow through said stator windings depending on the rotary position of said rotor, an oscillator for controlling said switches having a feedback amplifier and a feedback with an LC oscillating circuit which includes said sensing coil, a metallic element having the shape of annular segment attached to said rotor which cyclically sweeps past said sensing coil to alter the inductivity thereof to alternately switch said oscillator on and off, said metallic element being secured to an end face of said rotor transverse to the axis thereof; said metallic element extending electrically over an angle of rotation of the rotor of 180° and physically less than 180° having regard to the finite dimensions of said sensing coil, said element having a width

substantially equal to the diameter of said sensing coil, said element being positioned so that control signals displaced in phase through 180° are derivable from the signal of said sensing coil, the mean length L and mean radius R of said segment as well as the diameter D of said sensing coil meeting the condition $RX\pi > L > (RX\pi) - D$.

4,167,692

BRUSH-LESS DC MOTOR

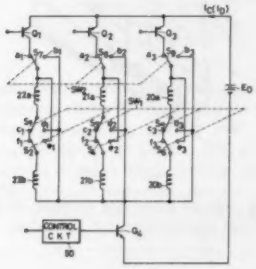
Tetsuo Sekiya; Hiroyuki Uchida, both of Yokohama; Hiroyuki Yamauchi, Urawa, and Kenkichi Umeda, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 845,435

Claims priority, application Japan, Nov. 1, 1976, 51-132136; Dec. 24, 1976, 51-156887; Jan. 21, 1977, 52-6575[U]; Feb. 2, 1977, 52-11477[U]

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **17 Claims**



1. A brush-less DC motor comprising: magnetic means constituting a stator member; a stationary cylindrical member projecting from said stator member and having bearings on the inner surface of said stationary cylindrical member; a rotary shaft rotatably supported by said bearings in the stationary cylindrical member and extending axially from the opposite ends of the latter; a rotor assembly including a rotary cylindrical member into which said stationary cylindrical member is inserted and being fixed to said shaft at a portion of the latter extending axially from one of said ends of the stationary cylindrical member, at least two axially spaced apart rotary discs of magnetic material fixed to said rotary cylindrical member, and a permanent magnet fixed to at least one of said rotary discs so as to leave an axial space between the latter; a rotational-position detecting member extending into said space; and a coil assembly including a plurality of coil units and also extending into said space; said shaft having a working poriton extending from the other of said ends of the stationary cylindrical member so as to be relatively close to said bearings for stable acceptance by the latter of lateral loads applied to said working portion of the shaft.

4,167,693

CONTROL ARRANGEMENT FOR A BRUSHLESS D-C MOTOR

Manfred Liska, Nüremberg; Hans Kühnlein, Nüremberg-Grossgrundlach; Georg Kögler, Schwabach, and Karl Schalk, Nüremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

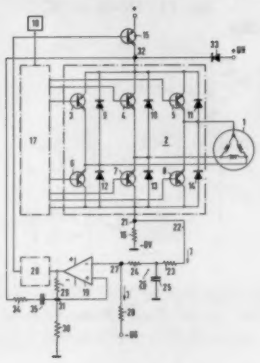
Filed Dec. 20, 1977, Ser. No. 862,425

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658321

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **19 Claims**

1. In a commutation device for a brushless d-c motor including a commutation circuit connected to the motor windings, a regulator circuit for providing constant current from a power source to the windings through the commutation circuit, the regulator circuit including a main transistor control means connected between the commutation circuit and the power source for controlling current from the power source to the commutation circuit and a threshold hysteresis level detector the output of which is connected to the main transistor control



means for controlling the main transistor control means, the improvement comprising means for increasing the threshold hysteresis of the level detector during the occurrence of current peaks generated by switching in the commutation circuit.

4,167,694

CONTROL DEVICE FOR A PERIODICALLY OSCILLATING MEMBER

Eduard Hille, and Jürgen Andermann, both of Dülmen, Fed. Rep. of Germany, assignors to Hergeth KG Maschinenfabrik und Apparatebau, Dulmen, Fed. Rep. of Germany

Filed Dec. 2, 1977, Ser. No. 856,943

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2654895

Int. Cl.² H02P *5/00, 7/00*

U.S. Cl. 318—321 **12 Claims**

1. A control device for a periodically oscillating member driven by driving means, the amplitudes of which member are different from each other when not oscillating within a predetermined oscillation range, said control device comprising:

(a) a pair of spaced movable sensors located along the path of said oscillating member for sensing the amplitude of said oscillating member in both directions and arranged to be engaged by said oscillating member and emit a signal when engaged;

(b) means movably supporting and guiding each of said movable sensors such that said sensor may be moved in one direction by said oscillating member when engaged thereby to a position where said oscillating member stops and may return in the opposite direction during movement of said oscillating member in the opposite direction;

(c) coupling means for rigidly coupling said pair of spaced movable sensors whereby when one of said sensors is engaged and moved by said oscillating member the other sensor is moved in the same direction to return said other sensor; and

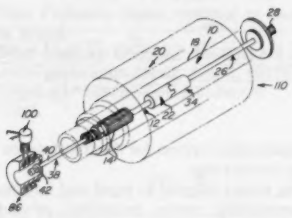
(d) control means for receiving signals from said sensors and in response thereto adjusting the speed of said drive means to maintain said oscillating member at a predetermined average speed.

4,167,695

GENERATOR DRIVE CONTROL SYSTEM

Ernest L. Phillips, Anchorage, Ak., assignor to Jet Accessories, Inc., Anchorage, Ak.

Filed Sep. 22, 1977, Ser. No. 835,574
Int. Cl.[2] F16D 13/22; H02P 9/06
U.S. Cl. 322—12 23 Claims



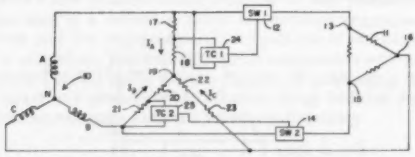
1. A generator drive control system for use in combination with an airplane having multiple engines, comprising:
- a generator drive train connected to each engine and driven thereby;
- a generator continually powered by each drive train under normal operating conditions;
- a power transmitting coupling in each drive train between the engine and the rotor of the generator;
- separate signal means located in the cockpit to indicate a failure condition of any individual generator;
- separate control means in the cockpit operable by the pilot in response to the failure signal to remotely cause decoupling of the associated drive train coupling; and
- a cross-connection switch with electrical leads to each generator and each engine, wherein the switch is actuatable by the pilot of the airplane to simultaneously electrically connect an active generator, which is continuously powered by an engine drive train under normal operating conditions, to the engine having the decoupled generator.

4,167,696

ZERO PHASE SWITCHING FOR MULTI-PHASE SYSTEMS

Zoltan L. Gyursanszky, Don Mills, Canada, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 20, 1977, Ser. No. 844,095
Claims priority, application Canada, Nov. 2, 1976, 264654
Int. Cl.[2] G05F 3/00
U.S. Cl. 323—18 18 Claims



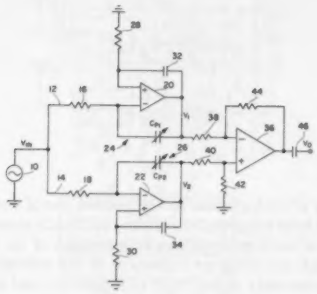
1. A multi-phase, zero phase control apparatus comprising:
- supply terminal means for the supply of multi-phase power;
- load terminal means for connection to a load;
- multi-line connecting means for connecting said supply terminal means to said load means, said multi-line connecting means having at least first and second switch means in respective first and second lines of said multi-line connecting means; and,
- first and second switch control means for energizing said first and second switch means respectively to conduct current, beginning at substantially the zero point in the current cycle, to the load means, said first and second switch control means having synchronization means connected between said multi-line connecting means and said first and second switch control means to insure that said first and second switch control means are synchronized to the current supplied to said load terminal means regardless of the conductive state of said first and second switch means.

4,167,697

CAPACITIVE PICK-OFF CIRCUIT

Joseph P. Gerber, Redmond, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Feb. 10, 1978, Ser. No. 876,602
Int. Cl.[2] G01R 27/26
U.S. Cl. 324—60 C 10 Claims



1. A differential capacitive pick-off circuit for measuring the relative capacitances of a first capacitor and a second capacitor comprising:
- a source of time varying voltage;
- a first operational amplifier including a first input terminal connected to said voltage source and an output terminal;
- a first feedback circuit, including the first capacitor, connecting said first amplifier first input terminal to said first amplifier output terminal wherein the first capacitor is effective to control the gain of said first amplifier;
- a second operational amplifier including a first input terminal connected to said voltage source and an output terminal;
- a second feedback circuit, including the second capacitor, connecting said second amplifier first input terminal to said second amplifier output terminal wherein the second capacitor is effective to control the gain of said second amplifier; and
- means for combining the outputs of said first and second amplifiers to generate a signal representing the difference in capacitance between the first and second capacitors.

4,167,698

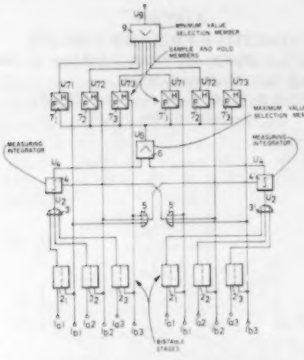
MONITORING THE CONDUCTION CUTOFF PHASE ANGLES IN RECTIFIERS

Johann Podlewski, Berlin, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt, Fed. Rep. of Germany

Filed May 23, 1978, Ser. No. 908,826
Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724796
Int. Cl.[2] G01R 31/22; H02M 7/12
U.S. Cl. 324—158 SC 3 Claims

1. In a method for monitoring the conduction cutoff phase angles of a plurality of current rectifier elements of a rectifier bridge circuit constituted by two groups of such elements, by forming, in an integrator for each group, a signal proportional in amplitude to the most recent cutoff phase angle for that group, determined by the time between the end of current conduction and the beginning of a positive blocking voltage of a respective element of that group, by erasing the integration

value provided by each integrator at the beginning of a positive blocking voltage at an element of the respective other group, and by selecting the maximum value of the integrator outputs at each instant, the improvement comprising: storing the maximum integrator output associated with the cutoff



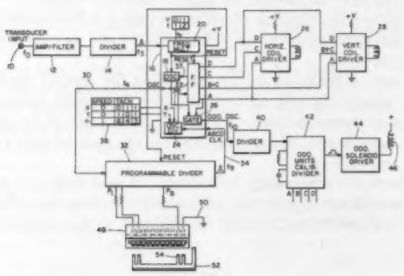
phase angle of each element in a respective one of a plurality of sample and hold members by enabling each such member at the beginning of each positive blocking voltage of its associated element; and providing an indication of the minimum one of the values currently stored in all of the sample and hold members.

4,167,699

USER CALIBRATED ELECTRONIC SPEEDOMETER AND ODOMETER

John D. Baker, Lisle, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Mar. 25, 1977, Ser. No. 781,205
Int. Cl.[2] G01P *21/02*
U.S. Cl. 324—171 **10 Claims**



1. A programmable circuit for driving the magnetic deflection circuits of a rate measuring gauge, such as a speedometer or tachometer, and a related odometer circuit responsive to received electrical pulses representative of detected movement comprising:

(a) logic means for applying current to said deflection circuits in a selected sequence to cause said gauge to provide an indication of the rate of the detected movement being sensed,

(b) means for clocking said logic means through said selected sequence at a predetermined clock frequency each time one of said electrical pulses is received,

(c) means programmable by the user for altering the output from said clocking means to calibrate said gauge to accurately represent the rate of movement being sensed,

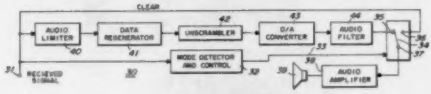
(d) said logic means including gate means for automatically maintaining said odometer unit in calibration with said rate measuring gauge.

4,167,700

DIGITAL VOICE PROTECTION SYSTEM AND METHOD

Richard H. Coe, Carpentersville; Daniel J. McQuade, Roselle, and David L. Weiss, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1977, Ser. No. 792,969
Int. Cl.[2] H04K *1/00*
U.S. Cl. 325—32 **4 Claims**



1. A communication system for the transmission of an information signal comprising:

transmitting means adapted to input said information signal, said transmitting means including: privacy encoding means adapted for predeterminedly encoding said information signal; and means for selectively producing either the clear information signal or the encoded signal at the transmitting means output; and

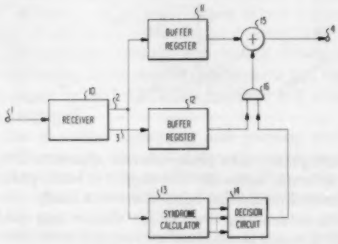
receiving means operable to process a plurality of received transmitted signals from a plurality of satellite receivers, said receiving means including: detector means for automatically analyzing a received signal and determining whether the received signal is said clear information signal or said privacy encoded signal; decoding means adapted to decode a privacy encoded signal: means for providing a control signal indicative of the signal quality of each received clear information signal; means for providing a control signal indicative of the signal quality of each received privacy encoded signal; comparator means for automatically switching one of the received clear information signals or privacy encoded signals to an output terminal thereof in response to said control signals; and means responsive to the detector means to pass the received clear information means to a receiver output and to pass a received privacy encoded signal through said decoding means to the receiving output.

4,167,701

DECODER FOR ERROR-CORRECTING CODE DATA

Takakuni Kuki, and Hiroyuki Tatsumi, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Oct. 25, 1977, Ser. No. 844,942
Claims priority, application Japan, Oct. 25, 1976, 51/128092
Int. Cl.[2] H03K *13/32*
U.S. Cl. 325—41 **4 Claims**



1. An error-correcting code decoder for decoding data from a radio frequency carrier wave modulated with data encoded according to an error-correcting code system, characterized in that said decoder comprises demodulator means for demodulating said data from said carrier wave, first means for detecting the level of electric field intensity of said carrier wave, means for correcting errors in said demodulated data, second

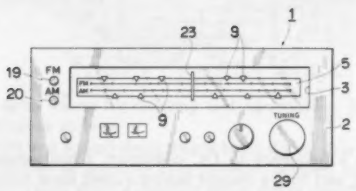
means responsive to a predetermined detected level of electric field intensity for blocking the output of said error correction means, and a Modulo-2 adder connected to said demodulator means and said gating means for providing the summation of the output of said demodulator mean and said gating means.

4,167,702

TUNING APPARATUS

Hajime Shichijo, Fujisawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,222
Claims priority, application Japan, Jun. 3, 1977, 52-64905
Int. Cl.[2] H04B *1/06*; H03J *5/10*
U.S. Cl. 325—455 **13 Claims**



1. A tuning apparatus comprising:

a dial plate marked with broadcast frequencies thereon;

at least one rotatably mounted guide shaft disposed parallel to said dial plate;

a plurality of marker means including a first engaging portion slidably disposed with respect to said dial plate with each said marker means being adapted to indicate a predetermined broadcast frequency;

a mount means slidably disposed for movement on said at least one guide shaft;

a dial pointer extending from said mount means to said dial plate to indicate a selected broadcast frequency on said dial plate;

sleeve means slidably and rotatably mounted on said at least one guide shaft, said sleeve means operatively interconnected with said mount means and including a second engaging portion;

tuning means operatively associated with said mount means, dial pointer and sleeve means to move said mount means, dial pointer and sleeve means along said at least one guide shaft responsive to operation of said tuning means; and

control means for rotating said at least one guide shaft to move said second engaging portion of said sleeve means from a first position remote from one of said plurality of markers to a second position in operative engagement with said first engaging portion of said one of said plurality of markers, said tuning means in cooperation with said control means being thereby capable of positioning said marker at a predetermined location along said dial plate corresponding to a desired broadcast frequency.

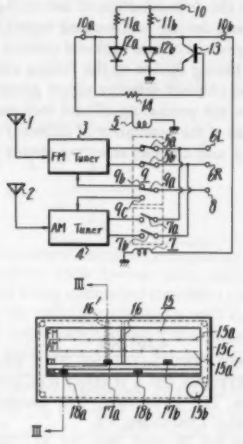
4,167,703

TUNING APPARATUS WITH BAND-SELECTION MEANS

Hisashi Suwa, Sagamihara, and Kohei Haneishi, Musashino, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 16, 1978, Ser. No. 906,407
Claims priority, application Japan, May 17, 1977, 52-56826
Int. Cl.[2] H04B *1/06*
U.S. Cl. 325—455 **12 Claims**

1. Tuning apparatus of the type including at least first and second tuners operable to be tuned over respective broadcast frequency bands and further including a dial scale calibrated in at least two sets of gradations to represent the particular frequencies in said respective frequency bands to which said tuners are tuned and an indicator movable across said scale to indicate the frequency to which a respective tuner is tuned, said apparatus comprising at least one first settable means associated with a corresponding frequency band to be set to a desired location along said scale; at least one second settable means associated with a corresponding different frequency band to be set to a desired location along said scale; sensor means coupled to and movable with said indicator to sense



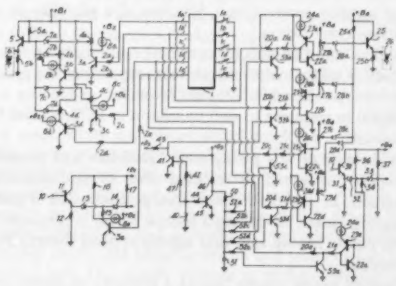
each of said first and second settable means as said indicator is moved across said scale; control signal generating means for generating a respective control signal when said indicator is positioned such that said sensor means senses a corresponding one of said settable means; and means responsive to said respective control signal for providing an output from a respective one of said tuners.

4,167,704

CHANNEL SELECTING APPARATUS

Masaru Sato, Asaka, and Takahiko Saito, Kamakura, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 5, 1978, Ser. No. 912,080
Claims priority, application Japan, Jun. 6, 1977, 52-66417
Int. Cl.[2] H04B *1/26*
U.S. Cl. 325—457 **15 Claims**



1. Channel selecting apparatus for use with first and second electrically tunable tuning devices, said channel selecting apparatus being operable to tune said tuning devices to preselected channels for receiving broadcast frequencies and comprising:

selectively operable channel selecting means common to said first and second tuning devices for generating and supplying channel selector signals to said first and second

tuning devices to determine the tuning condition of both said tuning devices;

control means for selectively producing a lock-out control signal; and

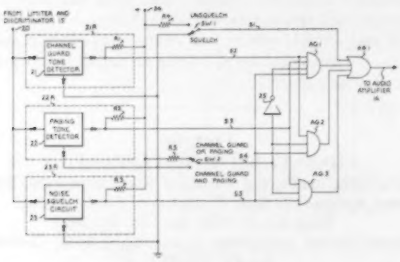
locking means coupled to said second tuning device and responsive to the absence of said lock-out control signal to enable the tuning condition of said second tuning device to be determined by said channel selector signals simultaneously with the determination of the tuning condition of said first tuning device; said locking means being responsive to the presence of said lock-out control signal to lock said second tuning device to the tuning condition determined by the channel selector signal generated immediately prior to the producing of said lock-out control signal, regardless of the generation of different channel selector signals by said channel selecting means.

4,167,705

CIRCUIT FOR CONTROLLING THE RESPONSE CONDITIONS OF A RADIO RECEIVER

Robert J. Martin, III, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Jul. 20, 1977, Ser. No. 817,220
Int. Cl.[2] H04B *1/16*
U.S. Cl. 325—478 **8 Claims**



1. A circuit for controlling the squelch and unsquelch condition of a radio receiver as a function of a plurality of other conditions comprising:

a. a plurality of circuits for connection to said radio receiver, each of said circuits respectively responding to a predetermined condition in said receiver for producing a first signal in response to said condition in said receiver being present;

b. a plurality of first gating means each having a plurality of inputs connected to selected ones of said plurality of circuits in a predetermined arrangement, each of said first gating means producing a second signal in response to all its inputs having said first signals applied thereto by said circuits;

c. second gating means having a plurality of inputs respectively connected to said plurality of first gating means for producing an unsquelch signal in response to the presence of any one of said second signals and for producing a squelch signal in response to the absence of all of said second signals;

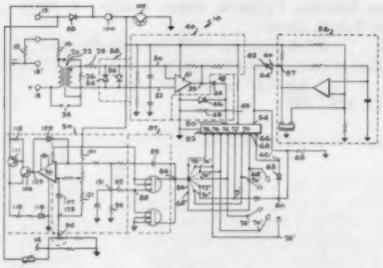
d. and first switch means connected to said second gating means for selectively applying a second signal thereto to cause said second gating means to produce an unsquelch signal.

4,167,706

TWO-WIRE FREQUENCY TO DC CONVERTER

Ronald L. Bodle, Northridge, and Gareth B. Dolby, Van Nuys, both of Calif., assignors to Moore Industries Inc., Sepulveda, Calif.

Filed Jan. 31, 1978, Ser. No. 874,038
Int. Cl.[2] H03K *5/00*; H02M *7/00*; H04B *1/12*
U.S. Cl. 328—26 **28 Claims**



1. In a frequency to DC converter, a multi-stage binary counter, said binary counter having a clock input terminal and a reset terminal for receiving reset pulses whose frequency is a multiple of the signal input frequency, an oscillator and a control gate, said oscillator connected to said clock input terminal through said control gate, each stage of said binary counter having an output terminal where a square wave pulse appears when the count of pulses from the oscillator to the binary counter has achieved a number corresponding to that stage, at least one stage of said binary counter having a full-running output frequency which is greater than the input frequency range, means for customizing the converter for a particular input frequency range, said means including an open terminal connected to the output terminal of each stage of the binary counter, each open terminal associated with a common terminal, said common terminal connected to said control gate, said control gate including an electrical device connected across the open terminal connected to the output terminal of said at least one stage and said common terminal, said electrical device selected so that after the count of pulses from the oscillator to the counter has achieved a number corresponding to the stage associated with the open terminal to which the electrical device is connected, a pulse appears at the first open terminal of said at least one stage and causes said electrical device to affect said control gate in such a way that it disconnects the oscillator from the clock input terminal until the next reset pulse whereby the frequency of the pulses at said at least one stage is equal to the frequency of the reset pulses and the frequency and pulse width of the output pulses at each stage of the binary counter is functionally related to the input frequency to the converter, the output terminal of a second stage of said binary counter before said at least one stage connected to a current averaging device to convert the pulses appearing at the output terminal of said second stage to a DC value whose magnitude is precisely related to the signal input frequency.

4,167,707

SYMMETRICAL DIGITAL PHASE SHIFTER

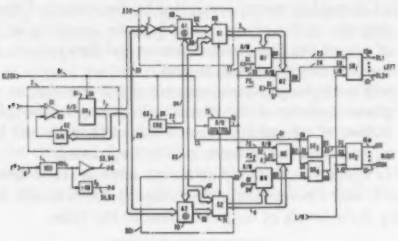
Robert S. Gemp, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 774,726, Mar. 7, 1977, Pat. No. 4,131,936.
This application Mar. 16, 1978, Ser. No. 887,287
Int. Cl.[2] H03K *5/15*
U.S. Cl. 328—55 **2 Claims**

1. Symmetrical digital phase shifter for generating in relation to an input signal a right output signal and a left output signal said right and left output signals being shifted symmetrically in opposite directions by a predetermined same amount relative to the phase of said input signal, comprising:

first delay means for delaying said input signal by a time amount equal to a given amount minus said predetermined same amount;

second delay means for delaying said input signal by a time amount equal to said predetermined same amount to generate an intermediary signal;



third delay means for delaying said intermediary signal by said given amount;

said first and second delay means being digital delay means controlled in real time by a common counter, said third delay means being a constant phase shifter device.

4,167,708

TRANSISTOR AMPLIFIER

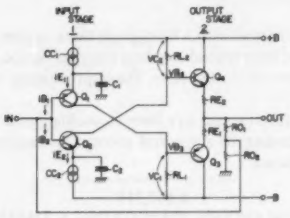
Motoomi Goto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 7, 1978, Ser. No. 884,215

Claims priority, application Japan, Mar. 10, 1977, 52/28946[U]

Int. Cl.[2] H03F *3/18*

U.S. Cl. 330—263 **3 Claims**



1. A transistor amplifier comprising:

a first transistor of pnp type having a base, a collector connected through a resistor to a negative potential line, and an emitter grounded through a capacitor and connected through a constant current source to a positive potential line;

a second transistor of npn type having a base coupled to the base of said first transistor and connected to an input terminal of said transistor amplifier, a collector connected through a resistor to said positive potential line, and an emitter grounded through a capacitor and connected through a constant current source to said negative potential line;

a third transistor of pnp type having a base connected to the collector of said first transistor, a collector connected to an appropriate negative potential line, and an emitter connected to an output terminal of said transistor amplifier; and

a fourth transistor of npn type having a base connected to the collector of said second transistor, a collector connected to an appropriate positive potential line, and an emitter connected to said output terminal.

4,167,709

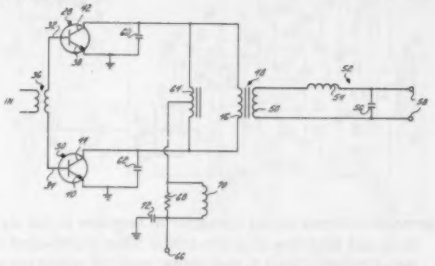
PUSH-PULL AMPLIFIER OUTPUT CIRCUIT

John C. Papson, Melville, N.Y., assignor to Communication Associates, Inc., Huntington Station, N.Y.

Filed Mar. 17, 1978, Ser. No. 887,509

Int. Cl.[2] H03F *3/26*

U.S. Cl. 330—276 **9 Claims**



1. A high frequency amplifier, comprising in combination, a pair of transistors, each having base, emitter and collector electrodes, and being connected together in a push-pull circuit arrangement, the collector electrodes each exhibiting a collector to emitter capacitance, input means for applying an input signal to the base electrodes of the transistors, output transformer means for deriving an output signal in common from the collectors of the transistors, and capacitance means connected between the collector and emitter electrodes of each transistor, each of said capacitance means having a capacitance value which is in the order of magnitude of several times the collector to emitter capacitance of the transistor at the normal collector voltage, whereby the variation in the output capacitance of said transistors with respect to the collector voltage is minimized to reduce parametric oscillations, said amplifier further comprising a low pass filter coupled to said output transformer for providing harmonic suppression, said filter being so constructed and arranged to avoid presenting a series resonance to any harmonic of the output signal, and resistance termination means for in-phase signal components between said push-pull circuit arrangement and said low pass filter, said resistance termination means comprising a 180° hybrid network interconnected between said push-pull arrangement and said low pass filter, said hybrid network including a port terminated in a resistor.

4,167,710

PULSE WIDTH MODULATED SIGNAL AMPLIFIER WITH PROTECTIVE MEANS

Tadao Suzuki, and Tadao Yoshida, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 28, 1977, Ser. No. 855,389

Claims priority, application Japan, Dec. 2, 1976, 51-145112

Int. Cl.[2] H03F *3/04*

U.S. Cl. 330—298 **18 Claims**

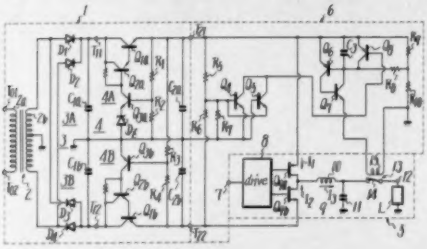
1. A pulse width modulated signal amplifier comprising

power supply means for providing a DC supply voltage;

amplifying circuit means powered by said power supply means and including input means for receiving a pulse width modulated signal, amplifying switch means having output electrodes and at least one control electrode, said output electrodes being arranged in a series circuit across which said DC supply voltage is applied, driving means connected with said input means for applying to said control electrode a drive signal corresponding to said pulse width modulated signal, an output terminal connected with one of said output electrodes of the amplifying switch means, and low pass filter means interposed between said one output electrode of the amplifying switch means and said output terminal so that said output terminal provides a demodulated output corresponding to said pulse width modulated signal;

detecting means for detecting the voltage level of said DC

supply voltage and providing a signal having an operating parameter which depends on the relation of said voltage level of the DC supply voltage to a predetermined value; and

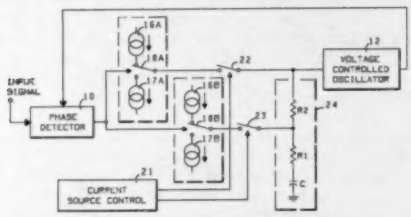


protective circuit means operative in response to the signal from said detecting means to inhibit the occurrence of said demodulated output at said output terminal whenever said level of the DC supply voltage exceeds said predetermined value.

4,167,711
PHASE DETECTOR OUTPUT STAGE FOR PHASE LOCKED LOOP

George W. Smoot, Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 26, 1978, Ser. No. 910,056
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—17 **7 Claims**



1. In a phase locked loop including a phase detector, a filter, and a voltage controlled oscillator, an output stage for the phase detector comprising combination:

a first current source;

a first current sink;

control means for controlling the level of current in the current source and the current sink;

first signal controlled switching means adapted to couple an output of one of the current source and current sink to the filter of the phase locked loop in response to the output signal of the phase detector of the phase locked loop;

a second current source;

a second current sink, the level of current in the second current source and second current sink being controlled by the control means alternately with control of the first current source and the first current sink; and

second signal controlled switching means adapted to couple one of the second current source and second current sink to the filter of the phase locked loop in response to the output signal of the phase detector of the phase locked loop.

5. In a phase locked loop including a phase detector, a filter, and a voltage controlled oscillator, an output stage for the phase detector comprising in combination:

a first current source;

a first current sink, the first current source and first current sink having a first predetermined current level;

a second current source;

a second current sink, the second current source and second current sink having a second predetermined current level;

control means;

first switching means coupled to the filter of the phase locked loop;

second switching means coupled to the filter of the phase locked loop, the first and second switching means being enabled alternately by the control means;

third switching means controlled by the output of the phase detector of the phase locked loop for coupling an output of one of the first current source and first current sink to the first switching means; and

fourth switching means controlled by the output of the phase detector of the phase locked loop for coupling an output of one of the second current source and second current sink to the second switching means.

7. In a phase locked loop an output stage in accordance with claim **1**, and wherein the output stage includes means for providing three levels of output current to the filter.

4,167,712
PRASEODYMIUM BLUE-GREEN LASER SYSTEM

Leon Esterowitz, Springfield, Va.; Filbert J. Bartoli, Upper Marlboro, Md.; Roger E. Allen; Lawrence S. Goldberg, both of Alexandria, Va.; Van O. Nicolai, Reston, Va.; Melvin R. Kruer, Oxon Hill, Md.; Arthur Linz, Winchester, and Hans P. Jenssen, Belmont, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1978, Ser. No. 874,005
Int. Cl.[2] H01S *3/094*
U.S. Cl. 331—94.5 F **10 Claims**

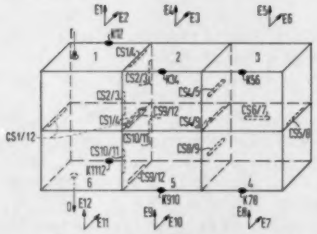
1. In combination with a blue-green laser system of the type wherein a dye laser is used to pump a crystal lattice doped with Praseodymium solid state laser, the improvement which comprises:

means for forcing said dye laser to oscillate at a wavelength corresponding to a spectral absorption maximum of said crystal lattice.

4,167,713
MICROWAVE FILTER EMPLOYING A THEORETICAL MINIMUM NUMBER OF COUPLINGS

Gerhard Pfitzenmaier, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 855,891
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1976, 2657649
Int. Cl.[2] H01P *1/20, 7/06*
U.S. Cl. 333—212 **4 Claims**



1. A filter for very short electromagnetic waves, comprising: a plurality of resonators constituting a plurality of filter

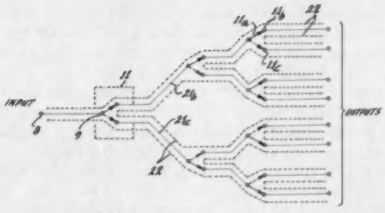
circuits, operated in the dual mode and coupled to one another, whose first and last resonators, respectively, are provided with connection lines for feeding electromagnetic energy in the direction of the energy to be transmitted, said filter including an additional coupling between at least two filter circuits which are not directly consecutive in the electrical mode of operation, and the individual resonators being arranged in two rows directly adjacent and respectively containing three resonators, said rows of resonators being mechanically symmetrically arranged such that the electromagnetic energy fed to the first resonator successively passes the resonators of the first row and subsequently the resonators of the second row and is decoupled at the output of the last resonator which is disposed directly adjacent the first resonator and in which the additional couplings are provided between the first and fourth filter circuits, between the fourth and ninth filter circuits, between the fifth and eighth filter circuits, and between the ninth and twelfth filter circuits.

4,167,714

CONSTANT IMPEDANCE TRANSMISSION LINE ROUTING NETWORK

Laurence P. Flora, Covina, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 20, 1978, Ser. No. 888,423
Int. Cl.[2] H01P 1/12
U.S. Cl. 333—101 **12 Claims**



1. In a system for providing a constant impedance transmission line which is switchable from one input to a plurality of output points, the network comprising:

(a) an input signal line having a high side and a low side;

(b) first switching means including a movable contact and first and second stationary output contacts, said movable contact connected to said input line and actuatable to connect either one of said first or second stationary output contacts;

(c) a first and second output line connected to said first and second stationary output contacts;

(d) means to actuate said movable contact of said input line;

(e) sealing means encompassing said switching means;

(f) a circuit board of insulating layers sandwiching a ground plane connected to said low side at said signal input line;

(g) shielding means encompassing said switching means and including connection means to said ground plane;

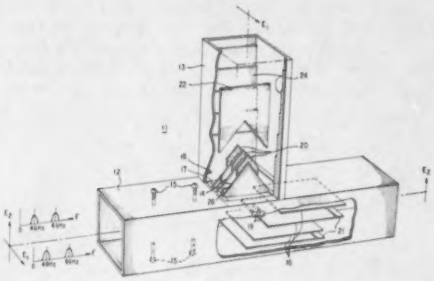
(h) first and second transmission lines connecting the output contacts and output lines of said switching means to an input line of a second and of a third switching means, said first and second transmission lines being of equal cross section and length and running parallel to said ground plane.

4,167,715

WIDEBAND POLARIZATION COUPLER

Edward A. Ohm, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 22, 1978, Ser. No. 918,078
Int. Cl.[2] H01P 1/16, 5/12
U.S. Cl. 333—125 **8 Claims**



1. A wideband polarization coupler comprising

a first conductively bounded square waveguide section (**12**) capable of supporting electromagnetic wave energy comprising first and second E-field components which are polarized in a first and a second direction, respectively, orthogonal to each other in a first and a second frequency band;

a second conductively bounded rectangular waveguide section (**13**) forming a junction with a sidewall of said first waveguide section and oriented to support the E-field components in the first polarization direction (E_1) in the first and second frequency bands;

a plurality of thin elongated first septa (**16**) disposed in said first waveguide section at the junction of said first and second waveguide sections in planes parallel to said first polarization direction, said septa being disposed such that successive septa overlap each other to form a staircase-like arrangement which is capable of reflecting said E-field components in said first polarization direction (E_1) toward said second waveguide section;

a symmetrical first iris (**17**) disposed at said junction of the first and second waveguide sections in a plane parallel to said first direction of polarization capable of introducing a shunt reactance to said reflected electromagnetic wave energy in the first polarization direction; and

an odd plurality of triangular-shaped conductive vanes (**14**) disposed in the second waveguide section at the junction of the two waveguide sections in planes that are parallel to the second polarization direction (E_2) and in such proximity to the E-field in said second polarization direction that said vanes are capable of completing the wall current path across said junction for the electromagnetic energy in the second polarization direction, said triangular-shaped vanes having a height which is optimized across the first frequency band;

characterized in that

the polarization coupler further comprises

a symmetrical second iris (**18**) disposed in said second waveguide section adjacent and parallel to said first iris which is capable of introducing a second shunt reactance to any reflected electromagnetic wave energy in the first polarization direction;

a plurality of tuning screws (**19**) mounted symmetrically adjacent to said junction through the sidewalls of said first waveguide section capable of introducing a capacitive reactance to said electromagnetic energy which is reflected into said second waveguide section;

an odd plurality of chevron-shaped conductive vanes (**20**) disposed in spaced-apart alignment with said odd plurality

of triangular-shaped conductive vanes in said second waveguide section, said combination of triangular-shaped vanes and spaced-apart chevron-shaped vanes having a height which is optimized across the second frequency band; and

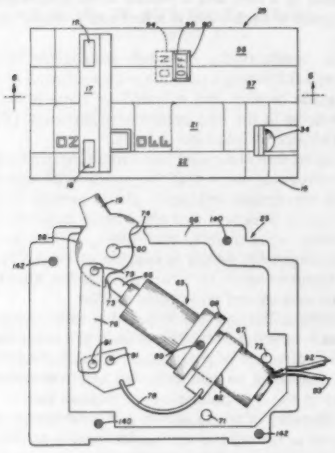
a single second septum (22) disposed in said second waveguide section in a spaced-apart alignment with the center one of the odd plurality of triangular-shaped and chevron-shaped vanes, said second septum having a longitudinal dimension capable of reflecting a fringing field of the E-field components in said second polarization direction and second frequency band back toward said junction which may not have been reflected by said chevron-shaped vanes.

4,167,716

CONTROLLED SWITCHING APPARATUS

John Horn, Philadelphia, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 3, 1978, Ser. No. 893,206
Int. Cl.[2] H01H *75/00, 77/00*
U.S. Cl. 335—14 **10 Claims**



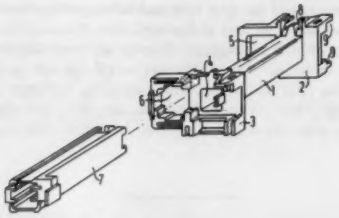
1. Controlled switching apparatus including a circuit breaker section and a remotely controllable operator section; said circuit breaker section including a set of cooperating contacts, trip-free spring powered operating means operatively connected to said contacts, said operating means including a manually movable operating member for selectively opening and closing said contacts, said operating member being oscillatable about a first fixed pivot as a center, fault responsive trip means operatively connected to said operating means for automatic activation thereof to open said contacts upon the occurence of predetermined fault conditions; said operator section including a rocker mounted on a second fixed pivot, a single remotely operated electrically energized unidirectional actuator operatively connected to said rocker to oscillate the latter about said second pivot as a center; said first and second pivots being axially aligned; and connecting means joining said operating member to said rocker for simultaneous operation whereby motion of said rocker controlled by actuation of said actuator is effective to move said operating member for both opening and closing said contacts.

4,167,717

ELECTROMAGNETIC RELAY

Gundokar Braumann, Neuried, and Adolf Schön, Söcking, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 27, 1977, Ser. No. 810,391
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1976, 2629052
Int. Cl.[2] H01H *9/02*
U.S. Cl. 335—202 **6 Claims**



1. An electromagnetic relay operative according to the flux superposition principle and comprising:

a tubular plastic coil form having a hollow longitudinal shaft, at least one longitudinal guide carried inside said longitudinal shaft, a transverse flanged member carried at each end of said longitudinal shaft, each of said flanged members having at least one hole with the respective holes of said flanged members being in longitudinal alignment;

an exciting coil wound around the outside of said longitudinal shaft between said flanged members;

at least one hollow plug-in shaft having a cross-sectional shape which mates with the shape of said holes and longitudinal guides in its interior, said plug-in shaft being supported in an aligned pair of holes in said flanged members;

a yoke having at least two parallel coplanar legs, said legs having adjacent free ends and adjacent base ends and being connected together at their base ends, one of the legs of said yoke being supported in the interior of said longitudinal shaft in cooperation with said longitudinal guide and another leg of said yoke being supported in the interior of said plug-in shaft in cooperation with the longitudinal guide therein;

a substantially L-shaped core member spaced from the plane containing the legs of said yoke, one leg of said L-shaped member being disposed parallel to said another leg of said yoke and supported in the interior of said plug-in shaft in cooperation with the longitudinal guide therein, and the other leg of said L-shaped member being disposed transverse to the legs of said yoke adjacent to the free ends thereof, said other leg of said L-shaped member having a free end which faces the free end of one of the legs of said yoke; and

an armature serving as a contact member disposed between said yoke and said L-shaped member and supported in the interior of said longitudinal shaft in cooperation with said longitudinal guide therein.

4,167,718

DIES SET FOR MAGNETIZING OUTER SURFACE OF MAGNETIC COLUMN

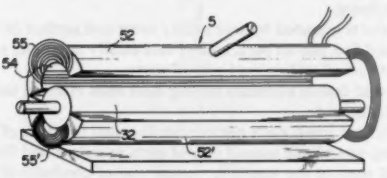
Hideki Harada, Urawa; Keitaro Yamashita, Kamisatomachi, and Katsunobu Yamamoto, Kumagaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Oct. 3, 1977, Ser. No. 838,452
Int. Cl.[2] H01F *13/00*
U.S. Cl. 335—284 **4 Claims**

1. A structure of dies set for magnetizing the cylindrical surface of a columnar magnet, the structure comprising:

a plurality of axially extending and circumferentially dis-

posed magnetic poles defining at their radially inner ends a through-bore for receiving a columnar permanent magnet material to be magnetized, said inner ends being located in close proximity to the outer cylindrical surface of said columnar permanent magnet material received by said through-bore; and



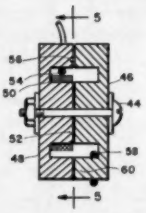
means for generating a triangular magnetic flux distribution having its peak value for each pole at the center of the magnetic pole and a continuously linear wave form between the adjacent poles.

4,167,719

VARIABLE RATIO TRANSFORMER

Charles O. Forge, Los Altos, Calif., assignor to Boschert Associates, Sunnyvale, Calif.

Filed Sep. 18, 1978, Ser. No. 942,923
Int. Cl.[2] H01F *21/02*
U.S. Cl. 336—77 **8 Claims**



1. A variable ratio transformer for producing a selectably adjustable secondary A.C. output voltage, said transformer comprising:

first and second substantially identical pot cores each having a cylindrical central leg ringed by first and second semicircular legs, said first and second cores being abutted together and adjustably rotatable on a common central axis;

a primary winding on the central leg of said first core;

a secondary winding on at least one of said semicircular legs of said first core; and

a short-circuited winding on the first semicircular leg of said second core.

4,167,720

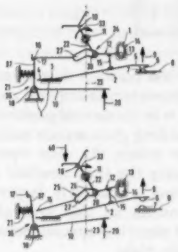
CIRCUIT BREAKER WITH SWITCHING ROCKER

Fritz Krasser, Altdorf, Fed. Rep. of Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed May 8, 1978, Ser. No. 903,672
Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721162
Int. Cl.[2] H01H *71/16*
U.S. Cl. 337—60 **20 Claims**

1. In a circuit breaker composed of a contact spring fixed at one end, carrying a movable contact at its free end, and biassed to urge the movable contact away from an associated fixed contact, a switching rocker pivotally mounted to selectively move between a breaker closing position in which it can act on the contact spring to urge the movable contact toward the fixed contact and a breaker opening position in which the rocker permits the contact spring to move the movable contact away from the fixed contact, the switching rocker being mounted to pivot about an axis which extends approximately perpendicular to the length of the contact spring, a release device arranged to be responsive to a current overload and operative to permit the contact spring to move the movable contact away from the fixed contact upon the occurrence of a current overload and independently of the position of the switching rocker, and a housing containing the contact spring, the switching rocker and the release device, the improvement wherein:

said circuit breaker further comprises a latching lever extending approximately parallel, and adjacent, to said contact spring and mounted to be movable in said housing between a contact closing position, and at least one contact opening position, said latching lever having a contact end which faces said free end of said contact spring and which is mounted to be displaceable in approximately the direction of switch opening movement of said movable contact, and having a detent end, which is opposite said contact end, said latching lever bearing against



said contact spring in a manner to apply thereto a force which is counter to the direction in which said spring is biassed;

said release device presents a detent abutment movable between a detent position in which said abutment can engage said detent end of said latching lever, and a release position in which said abutment is removed from the path of movement of said detent end;

said switching rocker is disposed at the side of said latching lever which is remote from said contact spring; and

said switching rocker includes an active end which protrudes toward said latching lever and which lies, when said rocker is in each of its positions, at a respectively different side of a line extending approximately perpendicular to the length of said latching lever and passing through the pivot axis of said rocker, said active end being operatively associated with said latching lever for moving said latching lever into its contact closing position when said rocker is in its breaker closing position and said detent end of said latching lever is in engagement with said detent abutment.

4,167,721

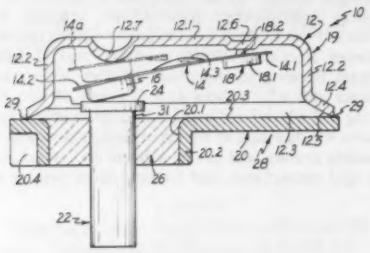
HERMETIC MOTOR PROTECTOR

Ronald E. Senor, North Attleboro, Mass., and Jan A. Abcouwer, Almelo, Netherlands, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 15, 1977, Ser. No. 833,408
Int. Cl.[2] H01H *37/04, 37/54*
U.S. Cl. 337—112 **6 Claims**

1. A thermally responsive motor protector comprising a cup-shaped electrically and thermally conductive housing having an open end, a thermally responsive electrically conductive bimetallic element secured at one end to the housing to extend in cantilever relation therefrom inside the housing, said element carrying a moveable contact at its distal end and being adapted to move from a first position to a second position in

response to heating of the element to a selected temperature, and an electrically and thermally conductive metal header plate secured in sealed relation to the housing over the open housing end, said plate having an opening therein, having a stud terminal of selected diameter extending through said opening, having a complementary electrical contact of relatively larger diameter secured to one end of the stud terminal in coaxial relation to the stud terminal at one side of the plate to be engaged by the moveable contact for closing a cricuit between the stud terminal and the plate when the bimetallic



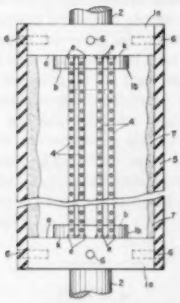
element is in the first position thereof and to be disengaged from the moveable contact for opening said circuit when the bimetallic element is in the second position thereof, and having an electrically insulating glass sealant material fused to the stud terminal and plate within the plate opening for sealing the opening and securing the stud terminal in the opening, said plate opening having a relatively larger diameter than said complementary contact so that said glass sealant material provides a selected electrical spacing between the complementary contact and the plate.

4,167,722

ELECTRIC FUSE CONSTRUCTION

Edward J. Knapp, Jr., Merrimac, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 25, 1978, Ser. No. 899,738
Int. Cl.[2] H01H *85/16*
U.S. Cl. 337—252 **11 Claims**



1. An electric fuse having a casing of electric insulating material, a pair of terminal elements of metal closing the ends of said casing, fusible elements conductively interconnecting said pair of terminal elements, and a pulverulent arc-quenching filler inside said casing surrounding said fusible elements wherein

(a) said pair of terminal elements comprises a first pair of spaced parts of metal circular in cross-section, each having an axially inner end surface;

(b) said pair of terminal elements further comprises a second pair of parts of metal separate from said first pair of parts each having an axially outer end surface in physical engagement with said axially inner end surface of one of said first pair of parts, said axially outer end surface of each of said second pair of parts having a smaller area than said axially inner end surface of each of said first pair of parts, each of said second pair of parts having a predetermined volume and each of said second pair of parts having an axially inner end surface and a lateral surface precluding said pulverulent arc-quenching filler from occupying said volume;

(c) ducts bounded by said axially inner end surface of one of said first pair of parts and by said axially outer end surface of one of said second pair of parts;

(d) said fusible elements having bent ends inserted into said ducts; and

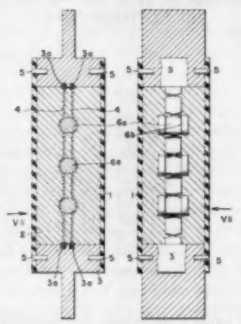
(e) solder joints each performing the dual function of bonding one of said second pair of parts to one of said first pair of parts at the interface thereof and of conductively connecting the ends of said fusible elements to the walls of said ducts.

4,167,723

ELECTRIC FUSE HAVING GAS-EVOLVING MATERIAL

Howard G. Wilks, Newbury, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 9, 1978, Ser. No. 867,964
Int. Cl.[2] H01H *85/38*
U.S. Cl. 337—273 **4 Claims**



1. An electric fuse having a gas-evolving substance to generate arc-extinguishing blasts of gas comprising a tubular casing of electric insulating materials, a pulverulent arc quenching filler inside said casing, terminal elements closing the ends of said casing, and at least two opposed, parallel extending fusible elements embedded in said arc-quenching filler and conductively interconnecting said terminal elements wherein the novelty consists of a block of gas-evolving material of shorter length than the diameter of said casing arranged substantially transversely to, and between, a pair of fusible elements, said block has a relatively small periphery which is hugged by said pair of fusible elements and has a relatively large periphery at the ends thereof projecting beyond the longitudinal edges of said fusible elements so that said edges substantially prevent movement of said block in a direction longitudinally thereof.

4,167,724

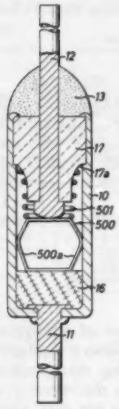
THERMAL SWITCHES

James R. McCaughna, 5521 E. Exeter Blvd., Phoenix, Ariz. 85018

Filed Nov. 14, 1977, Ser. No. 851,196
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—408 **8 Claims**

1. A thermal switch comprising a conductive casing defining a switch axis, a terminal connected to the casing and a terminal entering the casing in insulated relationship thereto, and within the casing a normally solid fusible pellet and a resilient contact

means normally in electrically conductive relationship with the insulated terminal, said resilient contact means comprising a hollow structure centered on the switch axis and which is normally subject to compression in the axial direction against said normally solid fusible pellet, to be expanded radially outwards to contact the casing and thereby establish an electrical



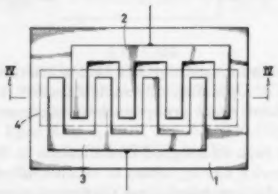
connection Serial No. 851,196 between the casing and the insulated terminal, said hollow structure also being capable due to its resilience of radial contraction out of contact with the casing when the axial compression is released, the pellet having a preselected temperature of disintegration at which it will collapse to release the axial pressure on the resilient contact means.

4,167,725

DEW-SENSING HYGROSCOPIC ELEMENT

Hidetoshi Shimizu; Hidemasa Tamura, and Yoshimi Makino, all of Yokohama, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 4, 1977, Ser. No. 821,913
Claims priority, application Japan, Jun. 30, 1977, 52/78084
Int. Cl.[2] H01L *7/00*
U.S. Cl. 338—35 **7 Claims**



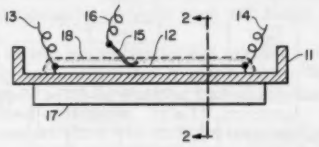
1. In a dew-sensing hygroscopic element including a pair of electrodes and a dew-sensing hygroscopic material arranged between said electrodes for detecting dew with the change of impedance between said electrodes, the improvement comprising wherein said dew-sensing hygroscopic material comprises polyvinyl alcohol having a saponification equivalent raging from 20 to 65 as a base material and containing therein an amount of an organic electrolyte in the range of 6×10^{-4} to 0.14 gram equivalent based on 100 grams of said dew-sensing hygroscopic material.

4,167,726

MAGNETIC LIQUID PROTECTOR

Frederick D. Ezekiel, 75 Allen St., Lexington, Mass. 02173

Filed Nov. 7, 1977, Ser. No. 849,223
Int. Cl.[2] H01C *1/02*
U.S. Cl. 338—231 **7 Claims**



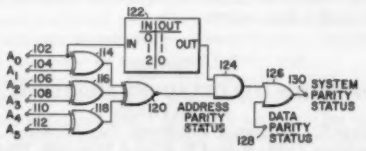
1. Apparatus for protecting from contamination comprising,
an electrical element subject to contamination whose electrical properties would be adversely affected by such contamination to be protected from the adverse effects of surrounding environment,
means for establishing a magnetic field in the region of said element to be protected from contamination,
and magnetic liquid covering said element in said region and continuously retained there by said magnetic field to prevent said element from being contaminated from the surrounding environment.

4,167,727

LOGIC CIRCUITS INCORPORATING A DUAL FUNCTION INPUT

Jack L. Anderson, Scottsdale; Frank J. Swiatowiecz, and Marvin A. Glazer, both of Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 8, 1977, Ser. No. 814,057
Int. Cl.[2] G06F *11/10*
U.S. Cl. 340—146.1 AG **10 Claims**



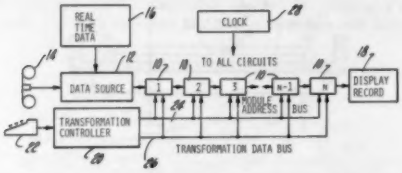
1. A logic circuit comprising:
(a) first input means for receiving a digital signal, the digital signal having at least three discrete logic levels;
(b) second input means for receiving at least one binary signal;
(c) at least one enabling means coupled to said first input means and responsive to the digital signal for generating at least one enable signal; and
(d) logic means coupled to said first and second input means and responsive to the digital signal and to the at least one binary signal for selectively generating a binary output signal representative of one of a plurality of logic functions, said logic means being responsive to the at least one enable signal for determining which logic function of the plurality of logic functions is represented by the binary output signal.

4,167,728

AUTOMATIC IMAGE PROCESSOR

Stanley R. Sternberg, Ypsilanti, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Nov. 15, 1976, Ser. No. 742,127
Int. Cl.[2] G06K 9/12
U.S. Cl. 340—146.3 MA **6 Claims**



1. Apparatus for analyzing patterns comprising:

generator means for producing a serial stream of digital electrical signals having a plurality of permissible states representing a matrix of points constituting a pattern;

a chain of substantially identical serial neighborhood transformation modules, each module having an input for receiving a series stream of digital output signals from the preceding module; neighborhood extraction means including a plurality of series connected digital storage devices for temporarily storing a neighborhood in the matrix comprised of the states of a central data point and its surrounding points in the matrix; means for shifting the signals through the storage devices to sequentially access all of the neighborhoods in the matrix; and digital control means coupled to the storage devices for analyzing each neighborhood as it is presented to the storage devices and providing an output signal to the input of the subsequent module depending upon the analysis, said control means comprising means for storing a neighborhood pattern and means for comparing said stored pattern with the neighborhood stored in the storage devices of the neighborhood extraction means;

central programmable means coupled to the control means of each module for selectively altering the analysis of the neighborhood of points in each module by providing the neighborhood patterns to the control means of the modules;

the first transformation module having its input coupled to said generator means, and the last module having its output coupled to an output device for utilizing the transformed output matrix.

4,167,729

APPARATUS FOR OBTAINING MULTI-SPECTRAL SIGNATURES

Dempster S. Christenson, Pittsburgh, Pa.; Michael F. Gordon, Sunnyvale, Calif.; Roland D. Kistler, Plymouth, Mich.; Frank J. Kriegler, Ann Arbor, Mich.; Seymour R. Lampert, Ann Arbor, Mich.; Robert E. Marshall, Ann Arbor, Mich.; Rowland H. McLaughlin, Ann Arbor, Mich., and Vernon H. Smith, Ann Arbor, Mich., assignors to Environmental Research Institute of Michigan, Ann Arbor, Mich.

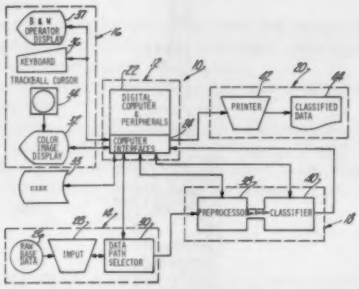
Continuation of Ser. No. 696,028, Jun. 14, 1976, abandoned.
This application May 30, 1978, Ser. No. 910,379
Int. Cl.[2] G06K 9/00
U.S. Cl. 340—146.3 AH **12 Claims**

1. In a system for the classification of a body of multispectral data vectors which represents a multivariate scene having a plurality of subject classes, the system having means for determining the spectral signature of each subject class and means for classifying the body of multispectral data vectors in accordance with the spectral signatures, the improvement comprising the inclusion in the means for determining the spectral signature of each subject class of:

storage means for storing the body of multispectral data vectors;

display means for displaying a data set from the body of data vectors which contains a subject class in a format forming a two-dimensional, ordered array;

operator control means responsive to an operator identification of the vertices of a polygon representing a subject class contained within a displayed set of data vectors;



means for identifying data vectors contained within the polygon defind by the operator; and

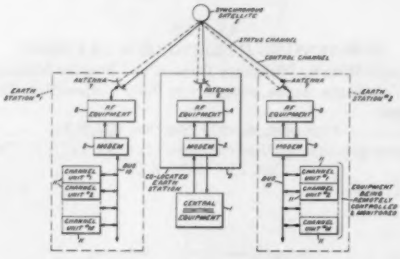
means for operating on data vectors identified as being contained within the polygon to compute a spectral signature.

4,167,730

COMPRESSION OF DATA ON STATUS OF REMOTE EQUIPMENT

Harry H. Brown, Norristown, Pa., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,664
Int. Cl.[2] H04Q 11/00
U.S. Cl. 340—163 **4 Claims**



1. In a system for securing, at a central control, information on the status of a plurality of remote devices

(a) divided into major groups each having an assigned identification;

(b) having each an assigned identification in the group;

(c) each device having means to receive, identify, and execute service commands from the central control addressed to the device by group identification and by individual identification within the group, and to refrain from executing service commands addressed to another device;

(d) each device having means to receive, identify, and execute polling commands from the central control, addressed to the device by group identification only, to enumerate synchronously with other devices in the group the successive individual identifications of the devices within the group, to stop such enumeration when the identification is reached in the enumeration of a device having status information new since the last such enumer-

ation while the device transmits such status information, and to continue the enumeration when such information has been transmitted; the improvement comprising:

(e) means to identify and execute a polling command to begin the said enumeration, and to continue the said enumeration during the subsequent reception, identification, and execution of service commands;

(f) means to identify and execute a polling command to stop the said enumeration.

4,167,731
INTEGRATING CODE CONVERTER

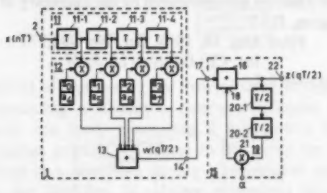
Ludwig D. J. Eggermont, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 26, 1978, Ser. No. 910,122

Claims priority, application Netherlands, Jul. 22, 1977, 7708159

Int. Cl.[2] G06F *5/06;* H03K *13/22*

U.S. Cl. 340—347 DD **2 Claims**



1. A circuit arrangement for converting a sequence of digital input code words occurring with a first sampling frequency (F_s) and representative of changes in the instantaneous amplitude of a data signal in the form of a differential code into a sequence of output code words occurring with a second, higher sampling frequency (mf_s) and representative of the instantaneous amplitude of the data signal in the form of an absolute code, comprising:

a non-recursive interpolating digital filter;

means to apply input code words applied to said filter;

means to output from said filter a sequence of digital auxiliary code words occurring with said second sampling frequency (mf_s) and which are also representative of changes in the instantaneous amplitude of the data signal; and

a digital integrator for converting said auxiliary code words into said output code words;

said digital integrator comprising:

a cascade arrangement of m delay sections which each realize a delay over a period of time $1/mf_s$.

4,167,732
MULTI-APARTMENT BUILDING COMBINATION COMMUNICATION AND SECURITY CIRCUIT

Axel J. Krawczyk, 15 Rochester Ave., Long Beach, N.Y. 11561

Filed Aug. 1, 1977, Ser. No. 820,459

Int. Cl.[2] G08B *25/00*

U.S. Cl. 340—524 **1 Claim**

1. A combination communication and security circuit for an apartment building having apartments and a lobby, comprising:

a first battery having positive and negative terminals,

a bell means located in each apartment and having positive and negative connections on each said bell means,

a first conductor connecting said positive battery terminal to said positive connection of each said bell means,

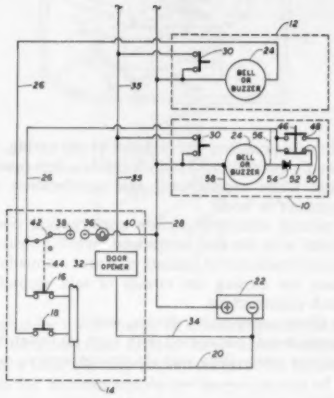
a plurality of normally open call button means located in the building lobby and connected with said negative battery terminal, each said call button means being associated with a particular one of the building apartments and operable for remote signalling of the particular apartment from the lobby,

a second conductor asscciated with each building apartment and connecting a corresponding one of said call button means with the negative connection of the bell means in the particular apartment with which said call button means and second conductor are associated for operating said bell means to signal the particular apartment when the corresponding normally open call button means is closed,

a second battery having positive and negative terminals,

a normally open alarm switch located in each apartment for initiating an alarm signal and connected between said first and second conductors,

alarm means associated with each apartment and comprising series-connected light-signalling means in the building lobby for identifying the apartment from which an alarm signal is initiated and a normally closed enabling switch normally enabling operation of said light-signalling means,



said second battery and said alarm means being series-connected between said first conductor and said second conductor with a polarity such that said second battery positive terminal communicates with said second conductor and said second battery negative terminal communicates with said first conductor,

a diode in series connection between each said negative bell means connection and said correspondingly-associated second conductor and effective for unidirectional signal transmission therethrough so as to prevent operation of said bell means by said second battery, and

link means between each said normally closed enabling switch and the corresponding normally open call button means associated with a particular apartment for opening said enabling switch when said call button is closed so as to disable said light-signalling means in the building lobby during operation of said call button means.

4,167,733
TAMPER-PROOF SECURITY ALARM SYSTEM

Edward B. Krause, 20 Meadow Wood Rd., Trumbull, Conn. 06611, and William Seiden, 3 Stoneboat Rd., Westport, Conn. 06880

Filed Jan. 10, 1977, Ser. No. 758,317

Int. Cl.[2] G08B *1/08;* H04Q *7/00*

U.S. Cl. 340—539 **17 Claims**

1. A device of the kind described, comprising in combination:

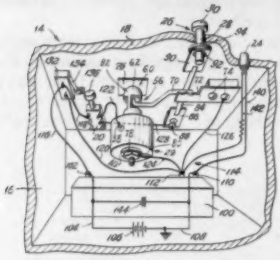
(a) a casing,

(b) an electrical, gravity-responsive switch construction disposed wholly in the casing, said switch construction being open-circuited when motionless and in a given

predetermined position, and being closed-circuited when it experiences either acceleration or arcuate movement, or both,

(c) suspension means for suspending the switch construction from a pivotal point above the same for free swinging movement, said suspension means enabling the switch construction, under the force exerted thereon by gravity, to occupy an infinitely large number of different arcuate positions within and with respect to the casing,

(d) manually releasable clamping means acting on said suspension means, for normally maintaining the switch construction in any given one of said infinitely large number



of arcuate positions with respect to the casing, thereby to normally maintain said switch construction open-circuited except when experiencing said acceleration or arcuate movement or both,

(e) a second electrical switch construction connected in parallel with the first-mentioned switch construction,

(f) means responsive to operation of said manually releasable means, for closing the circuit of said second electrical switch construction,

(g) an electro-responsive device, and

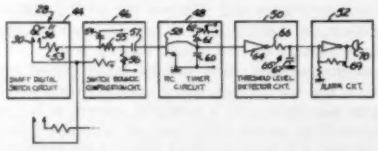
(h) circuit means connected with both said switch constructions, for controlling said electro-responsive device.

4,167,734

SHAFT SPEED AND HOT BEARING INDICATING APPARATUS

James D. Logan, Pullman, and Guy J. Swanson, Spokane, both of Wash., assignors to Watchdog, Inc., Spokane, Wash.

Filed Feb. 10, 1977, Ser. No. 767,290
Int. Cl.[2] G01D *21/00*; G08B *19/00*
U.S. Cl. 340—682 **10 Claims**



1. A shaft speed and hot bearing indicating apparatus for determining the speed of a shaft supported by a bearing and determining overheating of the bearing, comprising:

a transducer actuating means;

means for normally supporting the transducer actuating means on the shaft immediately adjacent the supporting bearing for rotation with the shaft in a prescribed normal annular path;

an electrical transducer for generating electrical pulses when actuated by the transducer actuating means;

means for mounting the electrical transducer with respect to the annular path of the transducer actuating means so that the electrical transducer is actuated during each revolution of the shaft to generate one electrical pulse;

said means for supporting the transducer actuating means being responsive to the temperature of the bearing for displacing the transducer actuating means from the annular path when the bearing is overheated to prevent the transducer actuating means from actuating the electrical transducer when the bearing is overheated;

a first electronic means operatively connected to the electrical transducer for receiving the generated electrical pulses and electronically computing and visually displaying the speed of the shaft in response to the number of pulses received in a prescribed time period; and

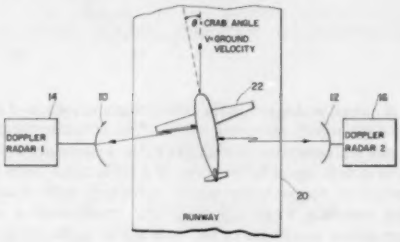
a second electronic means operatively connected to the electrical transducer for electronically determining the absence of generated electrical pulses for a prescribed period of time and in response thereto activating an alarm device.

4,167,735

AIRCRAFT ORIENTATION DETERMINING MEANS

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 18, 1978, Ser. No. 934,777
Int. Cl.[2] G01S *3/14, 9/44*
U.S. Cl. 343—5 LS **5 Claims**



1. Apparatus for producing a signal having a frequency which is a function of the crab angle of an aircraft which is coming in for a landing along a runway comprising:

first doppler radar means, located at one side of the runway, for irradiating the side of the landing aircraft which is facing it, receiving an echo therefrom, and deriving a doppler-frequency signal from said echo, said radar means having an antenna facing so that it radiates normally to the direction of the runway;

second doppler radar means, located at the other side of the runway, for irradiating the side of the landing aircraft which is facing it, receiving an echo therefrom, and deriving a doppler-frequency signal from said echo, said second radar means having an antenna facing so that it radiates normally to the direction of the runway, the distances of said antennas to the middle of the runway being equal, and the operating frequencies of the radar means being substantially equal;

first frequency-determining means, receiving the doppler-modulated output signal of said first doppler radar means for determining the doppler frequency thereof and providing an output signal in accordance therewith;

second frequency-determining means, receiving the doppler-modulated output signal of said second doppler radar means, for determining the doppler frequency thereof and providing an output signal in accordance therewith;

frequency-subtraction means, receiving the output signals of said first and second frequency-determining means as inputs, for subtracting its input signals from each other, the resultant signal having a frequency which is a function of the crab angle of the aircraft.

4,167,736

FLUID FLOW MEASUREMENT

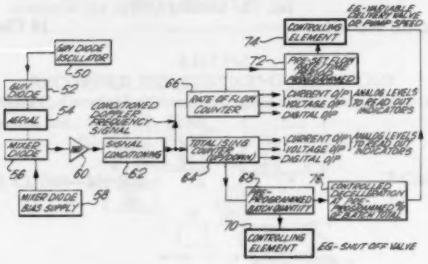
Hugh F. D. Tomlinson, Oswaldtwistle, England, assignor to Elektroflo Systems Limited, Blackburn, England

Filed Apr. 11, 1977, Ser. No. 786,568

Claims priority, application United Kingdom, Apr. 9, 1976, 14567/76

Int. Cl.[2] G01F *1/66;* **G01S** *9/02;* **H01Q** *1/04*

U.S. Cl. 343—5 NA **26 Claims**



1. A method of monitoring the flow of fluid, comprising the steps of mounting a dielectric microwave aerial in direct contact with the fluid, generating a microwave frequency electrical signal, passing the signal to the aerial for radiation into the fluid in a direction having a substantial component parallel to the direction of relative movement between the aerial and the fluid, receiving said radiated signal at said aerial after reflection by the fluid, and determining from the radiated and reflected signals the Doppler frequency shift therebetween as a measure of the fluid flow rate.

4,167,737

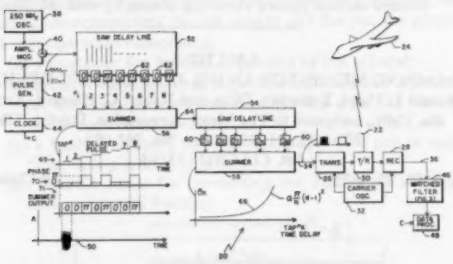
HYBRID PULSE COMPRESSION SYSTEM

Nathan Freedman, West Newton, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 9, 1978, Ser. No. 868,107

Int. Cl.[2] G01S *9/233*

U.S. Cl. 343—17.2 PC **5 Claims**



1. A pulse compression system comprising:

a code generator and a code receiver, said code generator and said code receiver each comprising first and second tapped delay line means;

said first delay line means having a total delay time equal to the delay time between successive taps of said second delay line means, the taps of said first delay line means imparting a phase code modulation to a pulsed signal incident upon said first delay line means and exiting sequentially via each of said taps of said first delay line means;

means for summing together signals exiting from said successive taps of said first delay line means, said summing means being coupled to an input terminal of said second delay line means;

said second delay line means including phase shifters at individual ones of the taps of said second delay line means for imparting phase shifts in accordance with a quadratic function of time delay between successive ones of said taps of said second delay line means; and

summing means coupled to output terminals of said phase shifters of said second delay line means for summing together signals appearing sequentially at output terminals of said second delay line means.

4,167,738

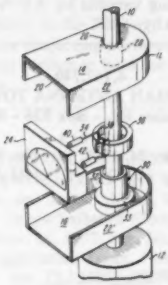
ANTENNA MOUNTED TUNING INDICATOR

Dennis Kirkendall, 220 Obispe St., Dayton, Ohio 45415

Filed Jun. 27, 1977, Ser. No. 810,018

Int. Cl.[2] H01Q *1/32;* **G01R** *27/06*

U.S. Cl. 343—703 **12 Claims**



1. Apparatus for use in tuning an antenna system the antenna rod unit of which mounts exterior to a vehicle comprising a body having a fixed opening therein constructed and arranged to mount to the antenna simply by the projection of the antenna rod unit within said opening, said body embodying therein coil means arranged by the mount of said body to position in immediate, spaced proximity to a portion of said antenna rod unit which positions within the limits of said body, in an orientation which disposes it at an essentially right angle thereto, said coil means forming the secondary of a transformer, the primary of which is provided by the portion of the antenna rod unit which positions within the limits of said body, and said coil means including in connection therewith a device incorporated in and forming a part of said body to signal from said body the tuned or untuned condition of the antenana unit to which the body is applied, said coil means being arranged to sense the R.F. current at the base of said rod unit and said body being free of any physical electrical connection to the antenna rod unit or any structure in connection with the vehicle to which it mounts.

4,167,739

INSTRUMENT LANDING SYSTEM GLIDEPATH ANTENNA ARRAY AND DRIVE THEREFOR

James G. Lucas, Wahroonga, and Alan C. Young, West Pennant Hills, both of Australia, assignors to University of Sydney, Sydney, Australia

Filed Nov. 4, 1977, Ser. No. 848,692

Claims priority, application Australia, Nov. 12, 1976, PC8120

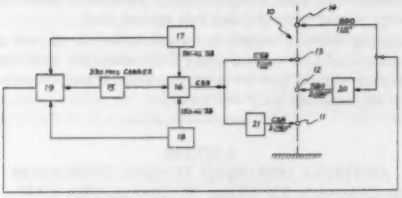
Int. Cl.[2] H01Q *3/26;* **G01S** *1/08*

U.S. Cl. 343—854 **2 Claims**

1. An instrument landing system for providing lower susceptibility to above ground interference and comprising an antenna array having four substantially equi-spaced elements arrayed one above another above a ground plane, the lowermost element and the centre one of the upper three elements being arranged to be driven to radiate CSB energy alone, and

the uppermost element and the centre one of the lower three elements being arranged to be driven to radiate SOB energy alone, the relative amplitudes and phases of the drive signals being

to the lowermost element, CSB 3/180°,



to the centre of one of uppeer three elements, CSB 1/0°,

to the uppermost element, SBO 1/0°,

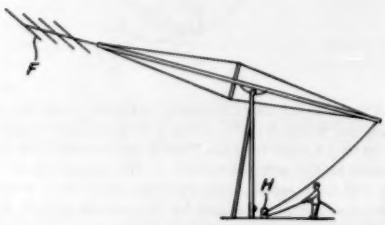
to the centre one of lower three elements, SBO 2/180°, the drive magnitudes being variable by ±15%, and by the phase angles being variable by +10°.

4,167,740

ONE MAN ANTENNA TOWER

James R. Shriver, Fisher Rd. - Box 526 - R.D. 1, Washington, Pa. 15301

Filed May 24, 1978, Ser. No. 909,310
Int. Cl.[2] H01Q *1/12*; E04H *12/34*
U.S. Cl. 343—882 **9 Claims**



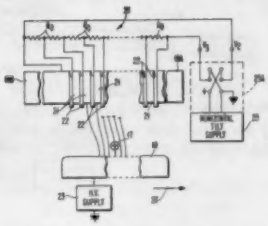
1. In a tower construction having a swingable central mast for carrying an antenna at its upper end and having an upright support structure to be ground level embedded for carrying the central mast, the improvement which comprises, a longitudinally extending column defining the central mast, a lower portion of said column being adapted to be positioned along the support structure to extend longitudinally thereof, said column having a gusset plate secured to extend from a side thereof at a mid position therealong, swing support means carried by an upper end of the support structure, swing pivot means cooperating with said gusset plate for operatively mounting said column in a swingable relation on said swing support means, a first latching ear means carried by a lower end portion of said column, a second latching ear means carried by a lower end portion of the support structure, a latch pin adapted to cooperate with said first and second latching ear means for retaining said column in an upright position along the support structure, said latch pin being removable from said first and second latching ear means to release said column for swinging movement on said gusset plate about said swing support means of the support structure, counterweight means slidably adjustably carried by the lower portion of said column for adjusting the center of gravity of the length of said column to accommodate its swing mounting with respect to the support structure to provide a slight off-balancing of an upper portion of said column about said swing pivot means when said column is to be swung with respect to the support structure, the lower portion of said column being of hollow tubular construction, said counterweight means being of solid heavy metal construction and being slidably adjustably carried within said lower portion of said column for longitudinal movement therealong, and means mounted on said lower portion thereof for securing said counterweight means in a selected adjusted relation with respect to said column.

4,167,741

RASTER SLANT CONTROL IN AN INK JET PRINTER

Roderick S. Heard, and David W. Phillips, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1977, Ser. No. 864,068
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **14 Claims**



1. An ink jet printer comprising in combination:

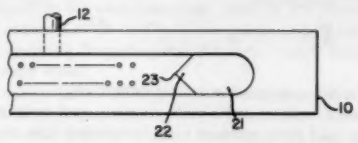
a nozzle for emitting a stream of ink drops; a charging electrode for charging said ink drops in accordance with signals to be recorded; first and second spaced apart deflection electrodes respectively on opposite sides of said stream of ink drops, voltage supply means connected to said deflection electrodes to effect an electric field intermediate said deflection electrodes to deflect ink drops in accordance with the magnitude of the charges on said drops; record receiving means for forming images indicative of the signals on said drops deflected by said deflection electrodes; carrier means mounting said nozzle and deflection electrodes and means for effecting relative movement between said record receiving means and said carrier means; and electrical means for producing a voltage difference across at least one of said deflection electrodes for distorting the electric field between said deflection electrodes to thereby control the tilt of an image formed on said record receiving means by said ink drops.

4,167,742

DAMPING MEANS FOR AN INK JET PRINTING DEVICE

Donald L. Head, Kettering, Ohio, and Robert C. Howard, Arcadia, Calif., assignors to The Mead Corporation, Dayton, Ohio

Filed May 1, 1978, Ser. No. 901,696
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **10 Claims**



1. In an ink jet printing device of the type having a manifold means forming a liquid reservoir, means supplying said reservoir with liquid under pressure, a flexible elongated orifice plate forming one side of said reservoir and containing a plurality of orifices disposed in at least one row through which said liquid is expelled, means stimulating said orifice plate to cause traveling wave vibrations therealong to induce formation of uniform filaments and droplets from said orifices and means for

catching said selectively charged droplets, wherein the improvement comprises:

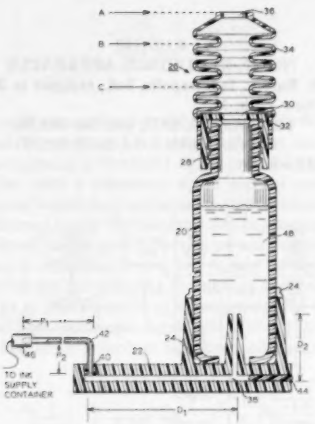
vibration damping means engaging end portions of said orifice plate beyond said orifices for substantially completely damping out said traveling wave vibration in said orifice plate as it reaches said end portions, said damping means having a V-shaped cross sectioned portion in a plane parallel to said orifice plate, the apex of said V-shaped portion extending towards the oncoming traveling waves in the orifice plate.

4,167,743

RECORDER PEN SERVICING ACCESSORY

William C. Corwin, La Grange, Ill., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jan. 5, 1978, Ser. No. 867,201
Int. Cl.[2] G01D *15/16*
U.S. Cl. 346—140 R **7 Claims**



1. A recorder pen servicing apparatus for cleaning, priming and preparing the pen and tubing of a capillary tube type pen recorder having a supply of liquid ink, a capillary tube pen, and tubing interconnecting the ink supply and the pen for periods of non-operation comprising:

(a) a container for holding a quantity of ink solvent;

(b) means communicating with the interior of said container for applying pressure and for drawing a partial vacuum within said container;

(c) a bushing adapted to receive the tip of the pen in snug, close fitting relationship; and,

(d) conduit means for connecting the interior of said container with said bushing.

4,167,744

ELECTROLUMINESCENT SEMICONDUCTOR DEVICE HAVING OPTICAL FIBER WINDOW

Paul Nyul, New Holland, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 23, 1978, Ser. No. 889,354
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—17 **7 Claims**

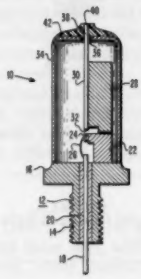
1. An electroluminescent semiconductor device comprising:

a housing

an electroluminescent semiconductor element mounted in said housing and having a light emitting surface,

an optical fiber mounted in said housing, extending through an opening in said housing and having a portion projecting beyond the housing said optical fiber having a pair of end surfaces with one end surface being adjacent the light emitting surface of the electroluminescent element and the other end surface being on the projecting portion of the fiber and adjacent the opening in the housing; and

means around the projecting portion of the fiber securing the



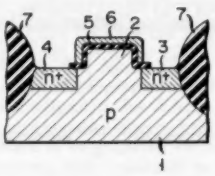
projecting portion to the housing, said means extending around the entire projecting portion of the fiber except for the adjacent end surface to hold the projecting portion in a rigid position.

4,167,745

MIS-TYPE FIELD EFFECT TRANSISTOR AND METHOD OF PRODUCING THE SAME

Masayuki Ishibashi, and Tuneo Morita, both of Kawasaki, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Nov. 16, 1977, Ser. No. 851,957
Claims priority, application Japan, Nov. 18, 1976, 51-137839
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 **5 Claims**



1. A MIS-type field effect transistor, comprising:

a semiconductor substrate of one conductivity type;

spaced-apart source and drain regions of the opposite conductivity type formed at one surface of said semiconductor substrate;

a semiconductor projection of said one conductivity type formed integrally on the substrate surface between said source and drain regions;

a gate insulation film overlying the surface of the projection between the source and drain regions; and

a gate electrode mounted on the gate insulation film, a long channel region being formed between the source and drain regions along the surface of the semiconductor projection.

4,167,746

RADIATION TRIGGERED THYRISTOR WITH LIGHT FOCUSSING GUIDE

Herbert F. Storm, Delmar, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 3, 1975, Ser. No. 555,057
Int. Cl.[2] H01L *27/14, 31/00*
U.S. Cl. 357—30 **14 Claims**

1. A monolithic semiconductor switch adapted to be triggered by a light source comprising:

a first semiconductor portion having first and second switch terminals and a gate terminal,

a second semiconductor portion connected in amplifying

gate relationship with said first semiconductor portion, said second semiconductor portion having a light sensitive gate area,

means converging light from said light source onto said light sensitive gate area.

4,167,747

COMPLEMENTARY MOSFET DEVICE AND METHOD OF MANUFACTURING THE SAME

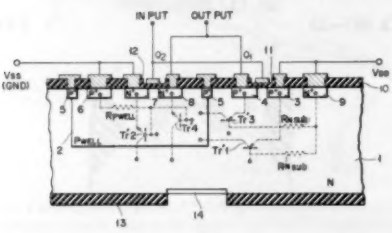
Kazuo Satou, Yokohama, and Mitsuhiko Ueno, Fujisawa, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 706,001, Jul. 16, 1976, abandoned. This application Mar. 24, 1978, Ser. No. 890,029

Claims priority, application Japan, Jul. 18, 1975, 50/87395; Jul. 18, 1975, 50/88064; Jul. 18, 1975, 50/88065; Jul. 18, 1975, 50/88066

Int. Cl.² H01L *27/02*

U.S. Cl. 357—42 **1 Claim**



1. A CMOS device comprising a semiconductor substrate of one conductivity type, a well layer of the opposite conductivity type formed in said semiconductor substrate, a first MOS transistor of one channel type comprising first drain and source regions formed in said substrate outside said well layer, a second MOS transistor of opposite channel type comprising second drain and source regions formed in said well layer, said substrate and said well layer respectively constituting, in the presence of impulse noise, the base region of first and second lateral parasitic bipolar transistors and the base region of first and second vertical parasitic bipolar transistors, said semiconductor substrate further comprising gold doping sufficiently to assure that the product of the current amplification factors β_1 of at least one of said lateral parasitic bipolar transistors and β_2 of at least one of said vertical parasitic bipolar transistors is smaller than 1.

4,167,748

HIGH VOLTAGE MONOLITHIC TRANSISTOR CIRCUIT

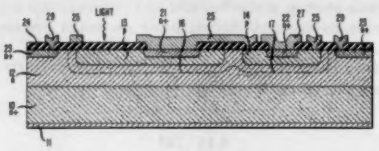
Robert S. D'Angelo, Summit; Adrian R. Hartman, Westfield, and Peter W. Shackle, Bridgewater, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 3, 1978, Ser. No. 921,229

Int. Cl.² H01L *27/02*

U.S. Cl. 357—46 **12 Claims**

1. A transistor circuit comprising an input transistor (T_1) and output transistor (T_2) having distinct emitter regions (**21** and **22**) of one conductivity type, distinct bases (**13** and **14**) of opposite conductivity type and a common collector portion (**12**) of said one conductivity type CHARACTERIZED IN THAT at least portions of said base regions are placed sufficiently close together so that the zero bias depletion regions of



said base regions overlap to produce a current therebetween sufficient to bleed off leakage current from the emitter-base junction of the input transistor when an external bias is supplied.

4,167,749

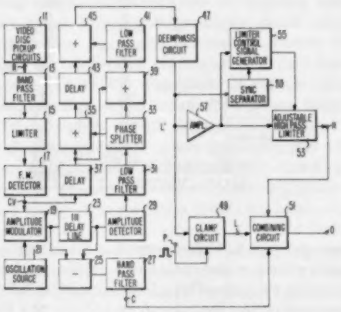
NOISE REDUCTION APPARATUS

Thomas W. Burrus, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 26, 1977, Ser. No. 801,001

Int. Cl.² H04N *5/14, 5/78, 9/535*

U.S. Cl. 358—8 **7 Claims**



6. Signal coring apparatus, for use with a source of signals comprising video signals subject to occupancy of a given band of frequencies and undesirably subject to accompaniment by noise, comprising:

means, coupled to said source, for filtering and amplifying the high frequency portion of said given band within certain amplitude limits;

means, responsive to the level of the noise accompanying the signal output of said source, for developing a control voltage subject to variation in response to variations in the level of noise accompanying said video signals; and

means for coupling said control voltage to said filtering and amplifying means to control the amplitude limits of the signals passed by said filtering and amplifying means, whereby the limits of said filtering and amplifying means are relatively small during intervals where the accompanying noise level is low and are relatively large during intervals where the accompanying noise level is high; and

combining means, responsive to said source of signals and to the output signal from said filtering and amplifying means, for combining the output signal from said signal filtering and amplifying means and the output of said source of signals, whereby said video signals are adjustably cored in response to variations in the level of noise accompanying said video signals.

4,167,750
COLOR-DIFFERENCE SIGNAL MODIFYING APPARATUS

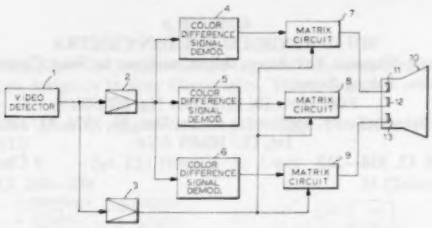
Tetsuo Tomimoto, Osaka; Yoshitomi Nagaoka, Neyagawa, and Reiichi Sasaki, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 657,626, Feb. 12, 1976, abandoned. This application Sep. 26, 1977, Ser. No. 836,904

Claims priority, application Japan, Feb. 20, 1975, 50/21748; Aug. 18, 1975, 50/100417

Int. Cl.[2] H04N 9/535

U.S. Cl. 358—27 **6 Claims**



1. A color difference signal modifying apparatus for modifying a color-difference signal in a color television receiver, the apparatus comprising a threshold signal producing means for being supplied with a luminance signal and for producing a threshold signal which is proportional to said luminance signal; a color-difference signal demodulator for producing a color-difference signal; and a gain reduction means coupled to said threshold signal producing means and to said color-difference signal demodulator for reducing the gain of the color-difference signal by at least a portion of the amount of the difference between said color-difference signal and said threshold signal only when said color-difference signal exceeds said threshold signal.

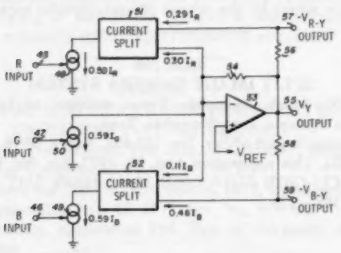
4,167,751
CURRENT MATRIX FOR ENCODING TELEVISION VIDEO SIGNALS

Milton E. Wilcox, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 12, 1978, Ser. No. 914,316

Int. Cl.[2] H04N 9/52

U.S. Cl. 358—30 **10 Claims**



1. A color television circuit for converting red, green, and blue color signal components into a luminance component and color difference components which represent the red component less the luminance component and the blue component less the luminance component, said circuit comprising;

means for converting said red, blue, and green signal components into proportional current analog values;

means for splitting said red current analog into a first red current and a second red current;

means for splitting said blue current analog into a first blue current and a second blue current;

means for summing said green current with said first red current and said first blue current and for converting said sum into an equivalent luminance analog voltage;

means for converting said second red current into an equivalent red analog voltage and for combining said red analog voltage with said luminance analog voltage to produce a red difference component; and

means for converting said second blue current into an equivalent blue analog voltage and for combining said blue analog voltage with said luminance analog voltage to produce said blue difference component.

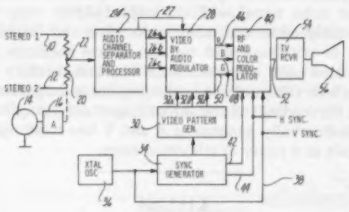
4,167,752
COLOR VIDEO DISPLAY FOR AUDIO SIGNALS

Jerome E. Liebler, 3182 Briar Hill, Milford, Mich. 48042, and Walter M. Rubinstein, 25801 Southwood, Southfield, Mich. 48075

Filed Oct. 3, 1977, Ser. No. 838,829

Int. Cl.[2] H04N 9/02

U.S. Cl. 358—82 **9 Claims**



1. A chrominance generator circuit for a television receiver having three chrominance inputs, comprising: means for receiving an audio signal and generating a plurality of first electrical signals, each of the first signals being a function of the instantaneous amplitude of one portion of the total frequency band width of the audio signal; means, independent of said first signals, for generating a plurality of second electrical signals as a function of a pattern to be displayed on the television receiver; three modulators, each connected to receive at least certain of said first signals and at least certain of the second signals to produce output signals which have functions of these input signals; and means for providing the three modulator output signals to the three chrominance inputs of the color television receiver.

4,167,753
PEAK DETECTING DIGITAL SCAN CONVERTER

Edgar T. Lynk, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,529

Int. Cl.[2] H04N 7/18

U.S. Cl. 358—140 **3 Claims**

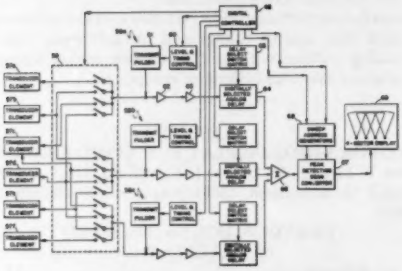
1. A peak detecting digital scan converter for converting ultrasound echo signals in multi-sector scan format to raster format for display in a cathode ray tube, said multi-sector scan being performed using a linear transducer array divisible into sub-arrays such that the origin points of sequential sector scans made by each sub-array are displaced longitudinally along the array and the scans are overlapping, comprising:

a random access digital memory having a matrix of memory cell locations each corresponding to an image pixel, said memory locations being accessed for the writing of incoming digital echo amplitude data and for the reading out of stored echo amplitude data by the coincidence of memory address signals on X and Y select lines,

an input analog-to-digital converter for digitizing input echo signals and an output digital-to-analog converter for con-

verting the stored echo amplitude data read out of each memory location to an analog output signal,

sweep address generator circuitry for successively producing preselected digital X and Y line memory address signals which increment at predetermined intervals and which in combination define an angulated scan line, said X line memory address signals being offset in dependence upon the sector being imaged,



a comparator circuit operative to compare the instantaneous input echo signal with the output signal read out of a currently addressed memory location and further operative to condition said random access memory to write digitized echo amplitude data into that memory location only when the incoming echo amplitude data is larger, and

means for reading out the stored largest echo amplitude data by sequentially generating X and Y line memory address signals in a raster at television rates.

4,167,754

SOLID STATE TELEVISION CAMERA WITH NOISE ELIMINATING CIRCUIT

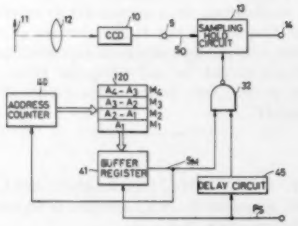
Fumio Nagumo, Yokohama, and Kaichi Yamamoto, Zama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 23, 1978, Ser. No. 871,636

Claims priority, application Japan, Jan. 28, 1977, 52/9108

Int. Cl.[2] H04N *5/21*

U.S. Cl. 358—167 **12 Claims**



1. A solid state television camera with a noise eliminating circuit comprising:

solid state image sensor means of semiconductor material for providing an output signal in correspondence to an image of an object projected thereon, said image sensor means including picture elements arranged in a raster having parallel scanning lines which are, in turn, arranged in order in a direction orthogonal to the direction of said scanning lines, and said semiconductor material having crystal defects at the locations of a plurality of said picture elements to create noises at corresponding times in said output signal;

memory means for memorizing the positions of said crystal defects in the semiconductor material, the position of the first of said crystal defects, considered in the direction along said raster, being memorized in said memory means as an encoded content representing the distance between a reference point on said raster and said first crystal defect, and the position of another of said crystal defects being memorized in said memory means as an encoded content representing the distance between a crystal defect previous to said other crystal defect and the latter;

address means for causing the encoded contents of said memory means to appear sequentially as the output from the latter in order of the positions of the respective crystal defects in said raster; and

control means responsive to said output of the memory means for eliminating said noises from said output signal of the image sensor means.

4,167,755

SOLID STATE TELEVISION CAMERA

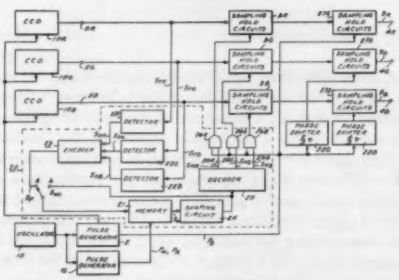
Fumio Nagumo, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 30, 1977, Ser. No. 855,990

Claims priority, application Japan, Dec. 14, 1976, 51/150144

Int. Cl.[2] H04N *3/14*

U.S. Cl. 358—213 **9 Claims**



1. A solid state television camera comprising:

(a) solid state image sensor means to pick up an image of an object and derive a plurality of picked up output signals;

(b) detector means to detect noises in picked up output signals when the solid state image sensor means pick up an image of a reference object and derive parallel outputs corresponding to the noise in the picked up output signals;

(c) means to change said parallel outputs of said detector means into one signal,

(d) memory means to memorize the rearranged outputs of said detector means,

(e) decoder means; and

(f) control means to control the outputs of solid state image sensor means by the output of said decoder means.

4,167,756

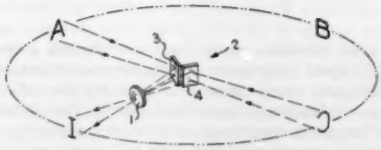
SPLIT IMAGE CAMERA SYSTEM

William V. Smith, Memphis, Tenn., assignor to Lectrolarm Custom Systems, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 721,502, Sep. 8, 1976, Pat. No. 4,058,831. This application Aug. 30, 1977, Ser. No. 829,253

Int. Cl.[2] G02B *27/14*; G03B *37/00*; H04N *7/00, 7/18*

U.S. Cl. 358—225 **5 Claims**



1. A split image camera system comprising:

a camera;

two planar members, each having a reflective coating on one of its planar surfaces; and

means for mounting both of said planar members such that the horizontal axes of said planar members intersect and the vertical axes of said planar members are substantially parallel with each other, wherein said planar members are mounted on said mounting means such that their reflective surfaces are facing the camera with which the mirror system is utilized and said planar members having their adjacent side edges closest to the camera and said side edges being separated by a sufficient distance so that a portion of the optical path of said camera is capable of obtaining a view from in between said planar members.

4,167,757

TELEVISION RECEIVER

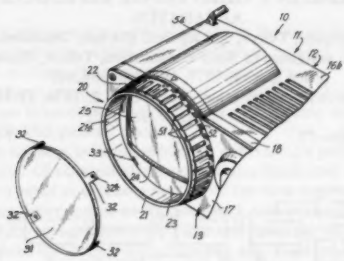
Kenichiro Kono, Tokyo, and Yoshio Ogawa, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 12, 1978, Ser. No. 905,452

Claims priority, application Japan, May 16, 1977, 52-62349[U]

Int. Cl.[2] H04N *5/64, 5/645*

U.S. Cl. 358—254 **16 Claims**



1. A television receiver comprising a cabinet having a panel with a circular opening in the latter; a frame having a generally cylindrical outer surface; means mounting said frame on said panel for rotation about the center of said circular opening with said cylindrical outer surface projecting from said panel; a cathode ray tube within said cabinet; means attaching said cathode ray tube to said frame for rotation with the latter; cooperatively engageable stop means on said cabinet and frame, respectively, for limiting the turning of said frame and cathode ray tube relative to said cabinet to within a predetermined angular range; and cooperative detent means on said frame and cabinet, respectively, for providing yieldable resistance to turning of said frame relative to said cabinet at a plurality of angularly spaced apart locations within said range.

4,167,758

METHOD AND DEVICE FOR TRANSMITTING FACSIMILE PICTURE SIGNALS

Ulf Rothgordt, Norderstedt, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 785,051, Apr. 6, 1977, abandoned. This application Jun. 15, 1978, Ser. No. 915,702

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1976, 2615486

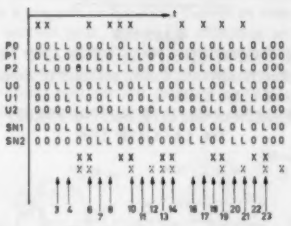
Int. Cl.[2] H04N *7/12*

U.S. Cl. 358—261 **4 Claims**

1. A method for transmitting facsimile picture signals obtained from an element-by-element scanning of an original by allocating code numbers to the pluralities of successive picture elements having the same luminance value, comprising the steps of:

extending each run-length having the value 1 to the run-length having the value 2;

suppressing any extended run-length if said extension results in a relative shift of the extended run-length by more than one picture element and allocating code numbers only to the converted run-lengths; and



directly releasing recovered, converted run-lengths at the receiving end.

4,167,759

APPARATUS FOR INSERTING AN ADDRESS SIGNAL IN A FRAME OF THE VERTICAL BLANKING PERIOD OF A TELEVISION SIGNAL

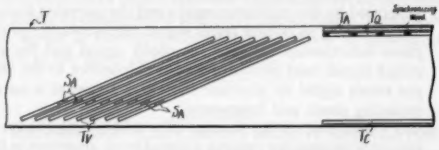
Katsuichi Tachi, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

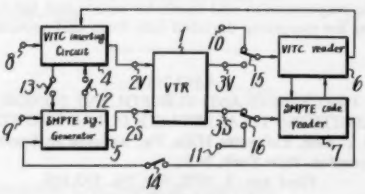
Filed Jul. 26, 1977, Ser. No. 819,173

Claims priority, application Japan, Jul. 31, 1976, 51-91552

Int. Cl.[2] G11B *27/14, 27/30, 27/32*; H04N *5/22*

U.S. Cl. 360—14 **3 Claims**





1. An editing system comprising:

(a) means for inserting a first address signal in the frames of a vertical blanking period of a video signal recorded on a video track of a tape;

(b) means for generating a second address signal recorded on a longitudinal track of said tape;

(c) a first reading circuit for reading said first address signal reproduced from said video track;

(d) a second reading circuit for reading said second address signal reproduced from said longitudinal track;

(e) means for selecting one address from either of said first address signal inserting means or said second address signal generating means in response to one of the outputs from said first and second reading circuits,

(f) further comprising first means for supplying an output from said first reading circuit to said first address signal inserting means, further comprising second means for supplying an output from said second reading circuit to said second address signal generating means, wherein said

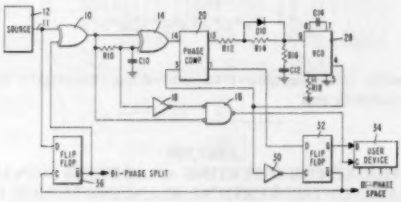
first and second supply means for selecting include first and second switches, and further comprising means for controlling said second address signal generating means by said first address signal inserting means.

4,167,760

BI-PHASE DECODER APPARATUS AND METHOD

David G. Decker, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 28, 1978, Ser. No. 891,087
Int. Cl.[2] G11B *5/09*
U.S. Cl. 360—40 **15 Claims**



1. An apparatus for decoding digital information from a signal encoded in accordance with bi-phase coding rules whereby the digital information is represented by signal level transitions at boundary and mid-cell locations of a sequence of data cell intervals occurring at a data clock rate comprising:

oscillator means for generating a clock signal frequency of two times the data clock rate;

phase comparator means coupled to receive the clock signal generated by the oscillator means and the encoded signals for providing an output result signal representative of the phase relationship between the clock signal and the encoded signal, said oscillator means responsive to the output result signal to generate the clock signal at a corresponding phase and frequency;

means responsive to the absence of a mid-cell transition in the encoded data for causing a signal level inversion in the encoded data coupled to the input of said phase comparator means before the termination of the data cell interval from which the transition is absent; and,

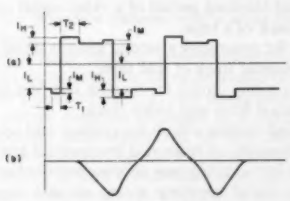
means responsive to said oscillator means and the encoded data for providing decoded data from said apparatus.

4,167,761

PRECEDENT AND SUBSEQUENT MINOR TRANSITIONS TO ALLEVIATE PULSE CROWDING

Donald T. Best, Lafayette Hills, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Apr. 3, 1978, Ser. No. 893,103
Int. Cl.[2] G11B *5/09*
U.S. Cl. 360—45 **15 Claims**



1. A method for improving the magnetic recording of digital data comprising the steps of

encoding digital data in the form of major transitions from one voltage level to another,

producing a composite current signal in response to each major voltage transition having a precedent minor current transition, a major transition and a subsequent minor transition in which said minor transitions are of lower amplitude and opposite direction relative to each major voltage transition, and

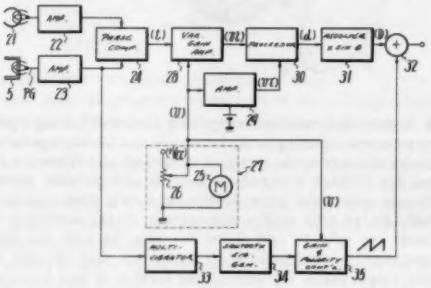
alternately gating said composite current signal to a magnetic recording head for recording corresponding digital data by magnetizing portions of a magnetizable medium in accordance with said composite current signal thereby providing corresponding readout pulses having a narrower pulse width and improved symmetry which enables increasing the packing density in the storage medium and enhances the accuracy in reading out the recorded digital data.

4,167,762

OPEN LOOP SERVO-SYSTEM FOR ACCURATE TRACKING IN A VIDEO SIGNAL REPRODUCING APPARATUS

Kazuo Hashizaki, Tokyo, and Kyoichi Shirane, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 1, 1977, Ser. No. 856,845
Claims priority, application Japan, Dec. 2, 1976, 51-145113
Int. Cl.[2] G11B *21/10, 5/52*
U.S. Cl. 360—77 **7 Claims**



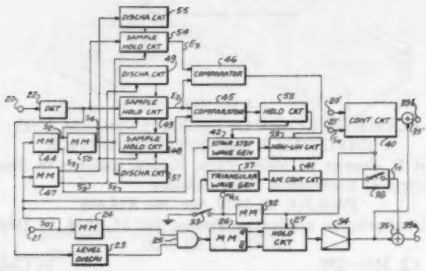
1. In an apparatus of the type wherein signal information is recorded in a plurality of parallel tracks on a record medium, said parallel tracks being disposed at a skew angle with respect to the direction of travel of said record medium, said apparatus having a rotary transducer for scanning said parallel tracks and an electro-mecnanical adjustable transducer support provided to support said transducer in scanning relation to said record medium, said transducer support being operative to displace said transducer transversely with respect to said parallel tracks in response to a drive signal, the improvement comprising an open loop servo system for generating said drive signal to align the scanning path of said transducer with one of said parallel tracks, said open loop servo system comprising first detecting means for detecting the position of the beginning of one of said parallel tracks in the direction of travel of said record medium and providing a first output, second detecting means for detecting the rotational position of said rotary transducer and providing a second output, speed signal generating means for generating an output signal corresponding to the speed of said record medium, and signal processing means receiving as inputs the outputs of said first and second detecting means and said speed signal generating means for generating said drive signal.

4,167,763

TRACKING-ERROR CORRECTING SYSTEM FOR USE WITH RECORD MEDIUM SCANNING APPARATUS

Yukio Kubota, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 18, 1977, Ser. No. 825,861
Claims priority, application Japan, Aug. 24, 1976, 51-101020
Int. Cl.[2] G11B *21/10, 5/52, 21/18*
U.S. Cl. 360—77 24 Claims



1. A tracking-error correcting system for use in apparatus of the type wherein signals are recorded in parallel tracks on a record medium, the system comprising:

transducer means for repeatedly scanning said record medium in successive scanning paths which may not coincide with said parallel tracks;

ramp signal generating means for generating a periodic ramp signal of substantially constant amplitude and of a duration equal to at least a portion of the time required for said transducer means to traverse each said scanning path;

level changing means coupled to said ramp signal generating means for selectively changing the level of said ramp signal in one direction;

signal level detecting means coupled to said transducer means for detecting the level of said signal reproduced by said transducer means during successive scans of said record medium;

comparing means for comparing with each other the detected levels of the signal produced by said transducer means at locations along the scanning paths thereof at respective selected times and for controlling said level changing means in response to the comparison of said detected levels;

drive signal generating means for generating a drive signal having a component proportional to the selective level-changed ramp signal; and

adjustable transducer support means for supporting said transducer means proximate said record medium and in scanning relation thereto, said support means receiving said drive signal and being operative to displace said transducer means transversely with respect to the direction along each of said parallel tracks as a function of the amplitude of said drive signal and thereby align each scanning path of said transducer means coincidently with one of said parallel tracks.

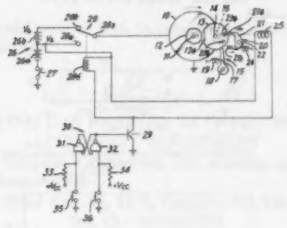
4,167,764

MODE CHANGING APPARATUS IN A TAPE RECORDER

Mitsuru Hanajima, Houya; Masaru Tezuka, and Yasushi Matsumoto, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 14, 1978, Ser. No. 942,164
Claims priority, application Japan, Sep. 14, 1977, 52-109989
Int. Cl.[2] G03B *1/04;* G11B *5/54, 15/26*
U.S. Cl. 360—90 10 Claims

1. In a tape recorder having a drive motor, a first gear rotatably driven by said motor, a second gear adapted to be rotatably driven by said first gear when in meshing engagement with the latter and having a toothless portion to permit rotation of said first gear independently of said second gear when the latter is disposed in a rest position with said toothless portion facing said first gear, actuator means adapting the tape recorder for a respective function thereof in response to turning of said second gear, means for effecting an angular displacement of said second gear from said rest position into meshing engagement with said first gear, and latching means normally holding said second gear in said rest position and being actuable to permit said angular displacement of the



second gear from the rest position into meshing engagement with said first gear so as to be driven by the latter in a substantially complete revolution whereupon said latching means again holds said second gear substantially in said rest position; the combination of drive circuit means selectively operative to drive said motor at two different speeds, power switch means actuable for causing energization of said drive circuit means, and drive control means operable upon actuation of said latching means to change-over said drive circuit means from driving said motor at the higher of said two speeds to driving said motor at the other of said two speeds.

4,167,765

TRANSDUCER SUSPENSION MOUNT APPARATUS

Robert B. Watrous, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 27, 1978, Ser. No. 928,750
Int. Cl.[2] G11B *5/48, 21/16*
U.S. Cl. 360—103 14 Claims

1. A magnetic head assembly comprising:

a rigid arm section;

a single piece spring/load beam element joined to said arm section, said element being substantially resilient adjacent to said rigid arm section and substantially rigid for its remaining length to present a loading force at its free end; and

a single piece rectangular type flexure of uniform thickness fastened to said element adjacent to its free end, said flexure having two outer flexible fingers parallel to an axis longitudinal to the assembly, joined at their ends by a relatively wider cross leg having a portion of its length in a plane that is offset from a plane formed by said two outer flexible fingers, and a central tongue extending from said offset portion of said cross leg with a free end centrally located and parallel to said two outer flexible fingers, said central tongue having a load protuberance that contacts the free end of said element

wherein said central tongue is offset a distance from said flexible fingers such that the height of said load protuberance is substantially equal to the amount of the offset for achieving flexibility of roll and pitch moment through said

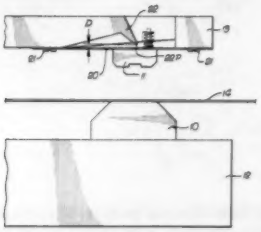
central tongue and said flexible fingers is a plane different from the plane formed by said element or said flexible fingers, thereby minimizing friction and debris generation.

4,167,766

FLEXIBLE DISK TRANSDUCER LOADING AND UNLOADING SYSTEM

Set B. Chau, Los Angeles, Calif., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Jun. 5, 1978, Ser. No. 912,469
Int. Cl.[2] G11B *21/20, 5/48*
U.S. Cl. 360—104 **5 Claims**



1. Apparatus for mounting magnetic transducers on the opposite sides of a flexible diskette recording medium comprising

a nonmovable magnetic transducer carriage having a magnetic transducer mounted thereon in a preselected fixed position with respect to the operating plane of a flexible magnetic recording diskette and to be engageable with one side thereof,

a movable magnetic transducer carriage having a magnetic transducer mounted thereon in a preselected position so as to be positionable in opposed relationship with the magnetic transducer on the nonmovable carriage so that when the movable carriage makes initial contact with the diskette the magnetic transducers on opposite sides of the diskette gently contact the diskette in a manner so that each of said two transducers respectively serves as a transducer diskette interface force for the other of said two transducers and provide means to insure the positive contact with the diskette,

the movable magnetic transducer carriage being mounted on the nonmovable carriage and having means whereby it is swingable into and out of operative relationship with the transducer on the nonmovable carriage,

the movable magnetic transducer carriage includes flexible means whose opposed ends are fixedly secured to said movable carriage for mounting the associated magnetic transducer in a plane parallel to the nonmovable carriage,

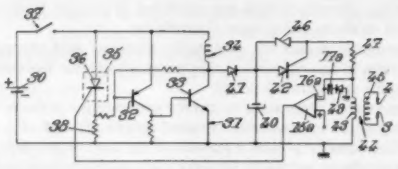
said movable carriage including means for loading its associated magnetic transducer with a preselected amount of pressure after the movable carriage establishes positive contact with the diskette and said transducer on the nonmovable carriage and maintains said preselected pressure between said two transducers when they are in an operative position with the diskette, the movable carriage including a transducer loading arm constructed and defined with a single point for applying pressure to the associated magnetic transducer, the point of the loading arm being adjacent said flexible means and being spaced a preselected distance from the mounting side of said associated magnetic transducer and being movable into engagement with and movable away from the last mentioned transducer when it is in an operative relationship with the magnetic transducer on said nonmovable carriage during the respective loading and unloading of the magnetic transducers, the preselected distance being defined to permit the transducer on the movable carriage to automatically adjust its contact surface to a parallel relationship with the transducer on the nonmovable carriage prior to engagement of the single point of the loading arm with a centrally located point on the flexible means and thus transmit this preselected pressure to the transducer on the movable carriage and thereby allow the two cooperating transducers to automatically adjust their diskette contacting surfaces to be parallel with the plane of the flexible diskette while in the operative position.

4,167,767

FLAME OR SPARK DETECTION SYSTEM AND COMBUSTIBLE GAS IGNITION DEVICE

Henri E. Courier de Méré, Paris, France, assignor to Bicosa Societe de Recherches, Clichy, France

Filed Jul. 13, 1977, Ser. No. 815,408
Claims priority, application France, Jul. 15, 1976, 76 21669
Int. Cl.[2] F23Q *3/00*
U.S. Cl. 361—256 **14 Claims**



1. Flame ignition apparatus comprising a combination of a flame detection system and a flame generator associated therewith, wherein said flame generator comprises:

an autonomous direct current source;

a manual switch;

a controlled switch having a control electrode means;

voltage step-up means comprising oscillator means and connected to said autonomous direct current source through said manual switch to be supplied DC energy by said source, said oscillator means being furthermore operatively connected to said controlled switch so that said control electrode means constitutes an inhibit input of said oscillator means;

a capacitor connected to the output of said voltage step-up means;

a voltage step-up transformer having a primary winding and a secondary winding;

a spark gap arranged between two electrodes, said electrodes being connected to said secondary winding;

a burner connected to a combustible fluid source and located close to said spark gap;

a triggered discharge circuit connected between said capacitor and said primary winding,

and wherein said flame detection system comprises:

means sensitive to a varying voltage in said voltage step-up transformer including means sensitive to the triggering voltage of the electric arc between said electrodes;

reference generating means for generating a reference voltage at least at each spark generation, and

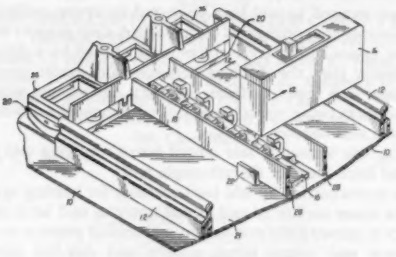
comparator means connected to said reference generating means and to said means sensitive to a varying voltage for comparing the voltages generated thereby; an output of said comparator means being connected to said control electrode means of said controlled switch for transmitting thereto a signal representative of the presence and absence of a flame at said spark gap.

4,167,768

SINGLE PHASE ELECTRICAL PANELBOARD

Andrew P. Baker, Swindon, and Peter E. G. Carpenter, Newbury, both of England, assignors to Square D Company, Park Ridge, Ill.

Filed Nov. 3, 1977, Ser. No. 848,060
Int. Cl.[2] H02B 1/04
U.S. Cl. 361—355 3 Claims



1. A panelboard assembly comprising:
a panelboard,
a bus bar extending longitudinally in said panelboard,
an insulating base plate supporting each end of said bus bar,
a pair of first support walls extending parallel to and spaced from said bus bar, each one of said pair of first support walls being located on a respective side of the bus bar,
a plurality of generally U-shaped connectors, each of said connectors having a back portion connected to said bus bar and opposite upwardly extending side legs, each leg having a cantilevered top portion extending towards the other leg in a generally parallel relationship to said bus bar,
a circuit controlling device mounted on either of said first support walls for pivotal movement towards one of said connectors,
a spring terminal connected to said circuit controlling device for engagement with a respective top portion of said connector, said circuit controlling device being adapted to abut against said cantilevered top portion to deform said top portion in response to the movement of said device past a predetermined position,
a pair of second support walls extending parallel to said bus bar and positioned intermediate said bus bar and each of said first supports respectively, said second support walls having a top edge at a selected position to engage said circuit controlling device adjacent said spring terminal in response to said pivoting movement to prevent movement of said device past said predetermined position and thereby prevent deformation of said top portion of said connector.

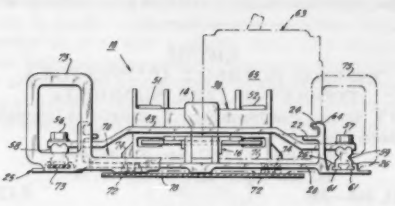
4,167,769

PANELBOARD HAVING DISTRIBUTED NEUTRAL

Roger D. Luke, Norcross, and John M. Rhodes, Atlanta, both of Ga., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 29, 1978, Ser. No. 920,154
Int. Cl.[2] H02B 1/04
U.S. Cl. 361—355 6 Claims

1. An electrical power distribution device including a base, first and second parallel elongated neutral bars mounted to said base, first and second elongated mounting formations on said base for supporting load ends of circuit breakers when the latter are mounted to said device, said first and second mounting formations being in the vicinity of the respective first and second neutral bars and being positioned inboard thereof, a line contact array disposed between said mounting formations to be electrically engaged with circuit breakers when the latter are mounted to said device, an electrical conductor disposed at one end of said array and having its opposite ends secured to said



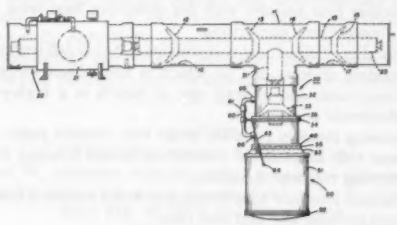
first and second neutral bars to provide an electrical connection therebetween.

4,167,770

ISOLATING GAS BARRIER BETWEEN BUS AND ACCESSORY EQUIPMENT

Howard W. Graybill, Greensburg, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Apr. 13, 1978, Ser. No. 895,946
Int. Cl.[2] H02B 1/04
U.S. Cl. 361—378 4 Claims



1. In a gas-insulated substation; an elongated gas-insulated bus comprising an elongated conductor at relatively high voltage extending coaxially within a coextensive dielectric gas-filled first housing at ground potential; said dielectric gas being at a pressure greater than atmospheric pressure; an electrical component disposed within a dielectric gas-filled second housing for connection to said elongated conductor; said second housing having a first gas barrier insulator extending across one end thereof; an intermediate connection assembly connecting said electrical component to said elongated conductor and comprising a short central conductor coaxially disposed within a short coextensive length of dielectric gas-filled grounded housing; and a second gas barrier insulator supporting said short central conductor within said short grounded housing; one end of said short grounded housing being connected to said first housing with their interiors in communication with one another; the other end of said short grounded housing being connected to said second housing and enclosing said first gas barrier insulator, whereby the interior of said short grounded housing is isolated from the interior of said second housing; said first and second gas barrier insulators being axially spaced from one another, whereby the interior of said second housing is isolated from the interior of said first housing by said first and said second barrier insulators; a first gas conduit means containing a valve means therein; said first gas conduit means extending between and communicating between the interior of said first housing and the interior of the volume of said short grounded housing contained between said first and second gas barrier insulators, whereby said volume of said short grounded housing communicates via said first gas conduit means with the interior of said first housing; a second gas conduit means extending between and communicating between said volume within said short grounded housing contained between said first and second gas barrier insulators and the interior of said second housing, whereby said volume of

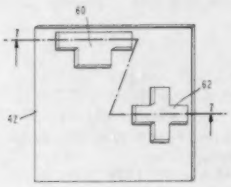
said short grounded housing communicates through said second gas conduit means with the interior of said second housing; and filter means connected in said first gas conduit means.

4,167,771

THERMAL INTERFACE ADAPTER FOR A CONDUCTION COOLING MODULE

Robert E. Simons, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1977, Ser. No. 807,096
Int. Cl.[2] H01L *23/34;* F28F *13/14*
U.S. Cl. 361—386 **5 Claims**



1. In a conduction cooling module of the type having a conduction heat transfer path for removing heat from electronic components comprising:

a plurality of electronic components to be cooled within said module at least one of which is low-power electronic component and at least one of which is a high-power electronic component;

a housing member included in the heat transfer path;

a heat sink adapted for connection to said housing for removing the heat therefrom;

a thermal interface adapter located in the interface between said housing and said heat sink;

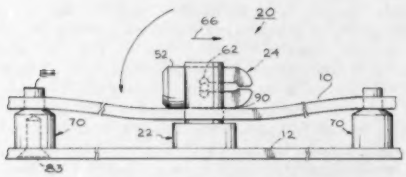
said thermal interface adapter having a predetermined thermal resistance and having cut-out portions therein opposite said low power electronic components thereby causing local increases in thermal resistance as a function of the amount of cut-out thereby causing said low-power electronic components within the module to operate at a higher temperature.

4,167,772

CIRCUIT BOARD MOUNTING MEANS

James R. Baehne, Reseda, Calif., assignor to Pertec Computer Corporation, El Segundo, Calif.

Continuation of Ser. No. 728,270, Sep. 30, 1976, abandoned. This application May 30, 1978, Ser. No. 910,092
Int. Cl.[2] H05K *7/12, 7/04;* F16B *19/00*
U.S. Cl. 361—399 **5 Claims**



1. In combination with a circuit board and base plate, mounting means securing said circuit board in spaced relationship with respect to said base plate, said mounting means comprising:

fastener means including a latch member and a spacer member;

said spacer member including a disk-like portion having a lower surface secured to said base plate, an upper surface adapted to support said circuit board and a post extending perpendicularly from said upper surface;

means supporting said latch member on said post for movement between a first position substantially parallel to said post and a second position substantially perpendicular to said post;

detent means for detenting said latch member in said second position;

first and second support members each having a lower surface secured to said base plate and an upper surface removably supporting said circuit board, each support member upper and lower surfaces being spaced by a distance greater than the distance between said spacer member upper and lower surfaces, said first and second support members being respectively spaced in opposite directions from said fastener means;

a first hole formed in said circuit board receiving said post and latch member therethrough; and

cam means carried by said latch member for bearing against the upper surface of said circuit board as said latch member is moved from said first to said second position to thus force said circuit board toward said disk-like portion upper surface.

4,167,773

PHOTOFLASH LAMP ARRAY HAVING CONTOURED SHEET SHIELD

James M. Hanson, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,609
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—13 **14 Claims**

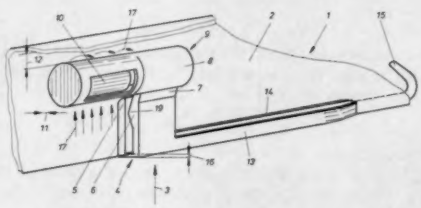
1. A multiple flash lamp array comprising a circuit board having circuitry for sequentially firing flash lamps and a plurality of flash lamps of the electrically fired type positioned over the front of said circuit board and connected electrically to said circuitry, wherein the improvement comprises an electrically conductive shield in the form of a conductive sheet member positioned behind and substantially parallel to said circuit board, said shield being provided with integral side portions extending frontwardly of said circuit board and substantially flanking said flash lamps.

4,167,774

HOODS FOR RECORD PLAYERS

Paul Knuchel, Oberburgstr. 48b; Benedikt Strausak, Merienweg 19; Rudolf Laeng, Frideggstrasse 9, and Josef Vavrina, Lyssachstr. 9a, all of CH-3400 Burgdorf, Switzerland

Filed Sep. 16, 1977, Ser. No. 833,742
Claims priority, application Fed. Rep. of Germany, May 17, 1977, 2722354
Int. Cl.[2] G11B *1/04*
U.S. Cl. 362—87 **3 Claims**



1. An illuminating device adapted to be attached to an inside sidewall of a record player hood comprising: a U-shaped plastic clamp element having a pair of legs adapted to straddle the hood sidewall and a thin base element connecting said legs, a lamp secured to one of said legs, a pair of separate U-shaped metal terminal means embedded in said clamp element for

providing the supply of current to said lamp from a mains cable connected to the other said leg of said clamp element, each of said terminal means being positioned in said clamp element to straddle the wall of the hood, and tilt actuated switch means mounted within said clamp element for turning on said lamp when inclined to a predetermined position, as when the hood is raised.

4,167,775

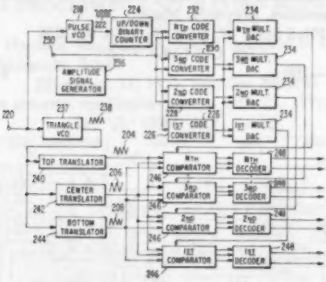
CONTROLLER FOR SYNTHESIZER CIRCUIT FOR GENERATING THREE-TIER WAVEFORMS

Richard H. Baker, Bedford, Mass., and Kevin E. White, Washington Township, Warren County, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 27, 1978, Ser. No. 890,460

Int. Cl.[2] H02M 1/12

U.S. Cl. 363—42 **20 Claims**



1. In a converter system comprising a waveform synthesizer circuit including a plurality of switching circuit means each responsive to individual control signals, for in combination operating to invert first and second DC voltages into a multi-tiered step-like notched output waveform substantially equivalent to a predetermined AC waveform, a method for producing said control signals comprising the steps of:

producing a reference AC waveform having a pattern corresponding to that of said predetermined AC waveform;

producing first, second and third AC sampling waveforms, each being in phase with the other, each having the same frequency, which frequency is substantially greater than that of said reference AC waveform;

concurrently comparing said first through third AC sampling waveforms with the uppermost, central, and lowermost portions, respectively, of said reference AC waveform for producing first, second, and third pulse width modulated pulse trains, respectively, the pulse widths of the pulses of each one of said pulse trains corresponding to the period of time that the amplitude of its associated sampling waveform is less positive or more negative than the amplitude of said reference waveform between two successive intercepts thereof; and

decoding said first through third pulse trains for producing the control signals for operating said plurality of switching circuit means.

4,167,776

INVERTER CIRCUIT

Nils H. Nygaard, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

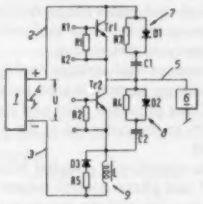
Continuation of Ser. No. 816,810, Jul. 18, 1977, abandoned. This application Sep. 29, 1978, Ser. No. 947,106

Claims priority, application Fed. Rep. of Germany, Jun. 17, 1977, 2632381

Int. Cl.[2] H02M 1/18

U.S. Cl. 363—56 **1 Claim**

1. An inverter circuit comprising a voltage supply and a pair of supply leads, at least one pair of series connected transistors and a supplementary circuit in series with said transistors extending between said supply leads, a consumer load connected to the junction of each pair of said transistors, an auxiliary circuit in parallel with each of said transistors including a capacitor in series with a parallel circuit of a resistor and a diode, said diode being poled to pass current in the same direction as the associated one of said transistors, means operating the two transistors of each said pair of transistors with alternating conducting periods and short nonconducting dead periods



respectively between said conducting periods to prevent short circuiting of said consumer load, each said conducting period being accompanied by the full supply voltage being applied across the nonconducting one of said transistors and the associated one of said auxiliary circuits, said supplementary circuit including a choke coil, said choke coil being large enough to substantially reduce the capacitor charging current through the conducting one of said transistors during each of said conducting periods to prevent damage to said transistors.

4,167,777

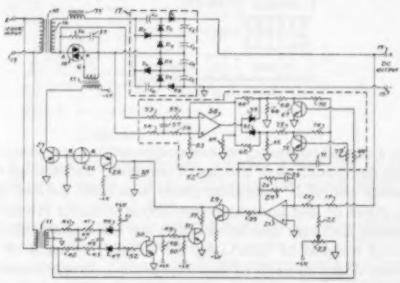
SWITCHING-MODE REGULATOR

Robert W. Allington, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Filed Feb. 24, 1978, Ser. No. 880,809

Int. Cl.[2] H02M 7/00, 7/155

U.S. Cl. 363—61 **20 Claims**



1. A regulated power supply of the switching mode class having power supply input means adapted to receive alternating current potential and power supply output means adapted to supply direct current electrical energy to a load, comprising:

switching means having an input terminal, a control terminal and an output terminal for blocking first portions and passing second portions of alternating half cycles of alternating current potential between the input terminal and the output terminal, the input terminal of said switching means being electrically connected to the alternating current potential;

phase-control means having an output connected to the control terminal of said switching means for increasing and decreasing said first portion relative to said second portions of alternating half cycles of alternating current potential;

negative feedback means being electrically connected between said power supply output means and an input of said phase-control means to provide a feedback signal that

varies inversely proportional to a potential derived from the power supply output means;

rectifier means for rectifying said second portions of the half cycles of the alternating current potential;

voltage multiplier means having a plurality of storage devices for storing in different ones of the storage devices with additive polarity electrical potential from different second portions of the half cycles of the alternating current potential to provide a potential for application to the power supply output means;

said rectifier means and said voltage multiplier means being electrically connected between said switching means and said power supply output means;

said storage devices of said voltage multiplier means being subject to receiving an unbalanced potential thereby imposing a dc off-set potential onto said switching means to cause instability in the potential at the power supply output means; and

correcting means operatively coupled between said switching means and said phase-control means to respond to the unbalanced potential and to remove the instability by eliminating the effect of the dc off-set potential on said switching means.

4,167,778

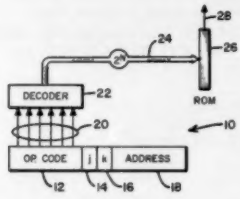
INVALID INSTRUCTION CODE DETECTOR

Ralph E. Sipple, Shoreview, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Continuation of Ser. No. 635,814, Nov. 28, 1975, abandoned, which is a continuation of Ser. No. 398,604, Sep. 19, 1973, abandoned. This application Jan. 30, 1978, Ser. No. 873,470

Int. Cl.[2] G06F *11/00*

U.S. Cl. 364—200 **4 Claims**



1. In a digital computer whose computations are controlled through the execution of a series of computer instructions each containing one of 2^N operation codes which are defined by N binary digits of said computer instruction wherein fewer than 2^N possible different operation codes are defined as valid, the improved method of indicating the validity of each of said operation codes of each of said computer instructions within said series of computer instructions comprising:

a. storing within a read-only memory of capacity 2^N addressable bits, a flag bit corresponding to each of said 2^N possible different operation codes wherein said flag bit is a binary one if said corresponding operation code is defined as valid and a binary zero if said corresponding operation code is not defined as valid;

b. temporarily storing one of said series of computer instructions currently scheduled for execution by said digital computer;

c. decoding said operation code of said temporarily stored one of said series of computer instructions currently scheduled for execution by said digital computer to generate an address of said read-only memory;

d. accessing said flag bit within said read-only memory at said generated address corresponding to said operation code within said temporarily stored one of said series of computer instructions currently scheduled for execution by said digital computer;

e. signaling said digital computer that said operation code within said temporarily stored one of said series of computer instructions currently scheduled for execution by said digital computer is valid if and only if said accessing revealed that said flag bit corresponding to said operation code is a binary one;

f. executing said temporarily stored one of said series of computer instructions currently scheduled for execution by said digital computer if said accessing revealed that said flag bit corresponding to said operation code is a binary one; and

g. repeating steps b through f for each one of said series of computer instructions.

4,167,779

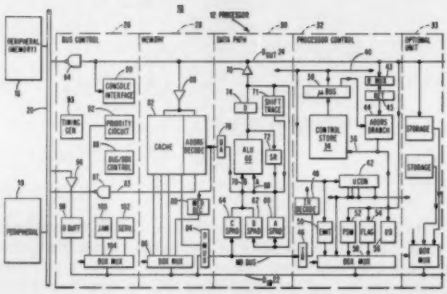
DIAGNOSTIC APPARATUS IN A DATA PROCESSING SYSTEM

Daniel T. Sullivan, Bolton; Charles H. Kaman, Newton Highlands; James F. O'Loughlin, Westford, and Jamshed R. Kapadia, Waltham, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Mar. 10, 1978, Ser. No. 885,228

Int. Cl.[2] G06F *9/06*

U.S. Cl. 364—200 **5 Claims**



1. In a data processing system, a processor for fetching, decoding and processing system instructions, said system instructions including move system instructions for moving information to and from the processor and diagnostic system instructions having a first part for identifying the diagnostic system instruction and a second part for specifying a particular diagnostic function, said processor comprising:

A. control store means having an input and an output and including a plurality of addressable storage locations for storing processor instructions, pluralities of said processor instructions being grouped together to form programs used by the processor for fetching and executing system instructions and including a program for fetching the second part of the diagnostic system instructions;

B. control store addressing means coupled to the input of the control store means for addressing the addressable storage locations in said control store means, the processor instruction stored in an addressed storage location being coupled to the output of the control store means in response thereto;

C. first decode means, having an input for receiving system instructions and an output coupled to the control store addressing means, for decoding said move system instructions and the first part of said diagnostic system instructions, said first decode means, in response to said decoded system instructions generating a signal at the output thereof utilized by said control store addressing means to address storage locations in the control store means containing a program which is utilized by the processor to execute the decoded system instruction;

D. second decode means having an input and an output, said output being coupled to the control store addressing means, for decoding the second part of a said diagnostic

system instruction and, in response thereto, generating an output signal utilized by the control store addressing means to address certain addressable storage locations in the control store means; and

circuit means, coupled to the output of the control store means and responsive to said processor instructions, for controlling the operation of the processor, said circuit means including means, responsive to said program in said control store means for fetching the second part of diagnostic system instructions, for transferring the second part of a diagnostic system instruction to the input of the second decode means;

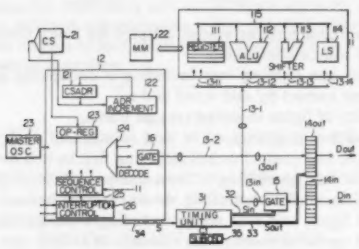
whereby, move system instructions in combination with diagnostic system instructions are used to diagnose and test portions of the processor, including the control store means.

4,167,780

DATA PROCESSING UNIT HAVING SCAN-IN AND SCAN-OUT MEANS

Hiromu Hayashi, Sagamihara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 21, 1977, Ser. No. 844,392
Claims priority, application Japan, Oct. 22, 1976, 51/127098
Int. Cl.[2] G06F *3/00, 11/06*
U.S. Cl. 364—200 **16 Claims**



1. A data processing unit comprising:

a means for providing given instructions;

a facility circuit division means for performing arithmetic and logical operations for given operand data in accordance with prescribed control data;

a control circuit division means, operatively connected to said facility circuit division means and said means for providing given instructions, for decoding said given instructions and providing said control data to said facility circuit division means in accordance with said decoded given instructions;

a first control bus means and a second control bus means operatively connected between said facility circuit division means and said control circuit division means for providing a data path therebetween;

input and output means, operatively connected to said first and second control bus means respectively by output and input control bus means, for enabling the transfer of data to and from said data processing unit;

a scan-in register means, operatively connected between said input means and said facility circuit division means by said input control bus means and said first control bus means, for storing external predetermined control data and for supplying said external predetermined control data to said facility circuit division means;

a scan-in gate circuit means, operatively connected between said scan-in register means and said input control bus means, for controlling the flow of data from said scan-in register means to said input control bus means;

a scan-out gate circuit means, operatively connected between said control circuit division means and said second control bus means, for controlling the flow of data from said control circuit division means to said second control bus means;

wherein said scan-in and scan-out gate circuit means are operated selectively to alternatively allow said external predetermined control data stored in said scan-in register or said control data produced by said control circuit division means to be transfered to said facility circuit division means to be transfered to said facility circuit division means; and

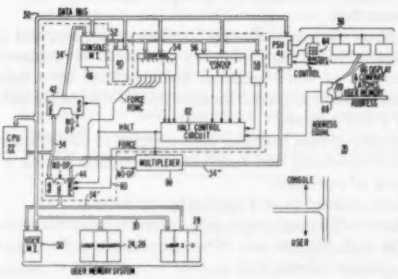
wherein said scan-in register is connected to a scan-in interface comprised of a shift register, and wherein said shift register receives and stores each group of bits of said external predetermined control data and also shifts said group of bits in said shift register reciprocally and sequentially, and when all the bits of said external predetermined control data are stored in said shift register, all the bits of said external predetermined control data are transferred to said scan-in register.

4,167,781

MICROPROCESSOR SYSTEM HAVING A SINGLE CENTRAL PROCESSING UNIT SHARED BY A PLURALITY OF SUBSYSTEMS EACH HAVING A MEMORY

Anthony R. Beccia, Cupertino; Robert D. Boehlje, Los Gatos; Peter T. Jacobsen, Santa Cruz, and Richard Olney, San Jose, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Oct. 12, 1976, Ser. No. 731,399
Int. Cl.[2] G06F *3/04, 9/18, 13/00*
U.S. Cl. 364—200 **3 Claims**



1. A microprocessor system wherein a plurality of subsystems shares a single central processing unit comprising:

a central processing unit;

a console subsystem including a memory, said console subsystem memory including a program counter for indicating the point of execution of an interruptable program and a data pointer identifying the location in the console subsystem memory of data being processed by the program in execution,

at least one user subsystem including a memory, said user subsystem memory including a program counter for indicating the point of execution of an interruptable program and a data pointer identifying the location in the user subsystem memory of data being processed by the program in execution,

a data bus operatively connected with the central processing unit and said console subsystem and said at least one user subsystem, for transferring data between said central processing unit and said console subsystem and said at least one user subsystem, and

a console control module interconnected with said data bus, said console subsystem, and said at least one user subsystem and controlling operation of said central processing unit with said console subsystem and said at least one user subsystem, the point of interruption of program execution in said console subsystem and in said user subsystem being

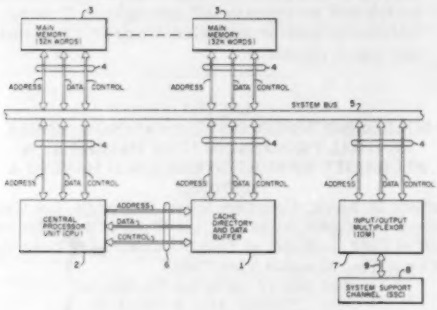
indicated by said program counter and said data pointer within each subsystem.

4,167,782

CONTINUOUS UPDATING OF CACHE STORE

Thomas F. Joyce, Burlington; Thomas O. Holtey, Newton Lower Falls, and William Panepinto, Jr., Tewksbury, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 22, 1977, Ser. No. 863,092
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **13 Claims**



1. A data processing system comprising:

a system bus;

an addressable main memory coupled to said bus, said main memory including a plurality of sets of word locations, each set of word locations being defined by a column address and each word location within a set being defined by a row address;

a plurality of data handling units coupled to said system bus for transmitting and receiving information during a bus cycle of operation;

a cache coupled to said system bus including:

a data buffer having a plurality of word locations arranged in a plurality of sets of word locations defined by said column address; and

a directory having a plurality of word locations corresponding in number to the number of sets in said data buffer and being addressable by said column addresses, each word location of said directory storing a row address of a corresponding one of said words of said set stored in said data buffer;

an input buffer coupled to said system bus, said data buffer, and said directory, said input buffer having a plurality of storage locations, and being operative to store information applied to said system bus by said data handling units and said main memory, during said bus cycle of operation only when said information is of a predetermined type for updating the contents of said data buffer when said directory indicates that said information is required to update information presently residing in said data buffer;

addressing means coupled to, said input buffer and to receive signals from said system bus coded to specify the type of information applied thereto during said bus cycle of operation;

said coded signals including:

a first signal coded to indicate that said information contains a main memory address,

a second signal coded to indicate a main memory write operation,

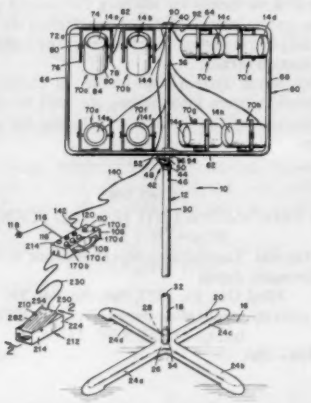
a third signal coded to indicate that said information has been accepted by said main memory.

4,167,783

PORTABLE LIGHTING SYSTEM HAVING A FOOT OPERATED DIMMER

William P. Mitchell, P.O. Box 42, Maryville, Tenn. 37801

Filed Aug. 30, 1977, Ser. No. 829,187
Int. Cl.[2] F21J *1/00*
U.S. Cl. 362—236 **15 Claims**



1. A portable lighting system adapted for being driven by a standard source comprising:

at least one lighting tree including a collapsible stand, a frame carried by said stand and a

plurality of lights mounted on said frame,

control means connected to said source and each of said lights, said control means including first switch means for selectively energizing at least one preselected light, and first means for controlling the intensity of at least one of said lights, said first means including a dimmer having a foot operated rheostat the intensity of at least one of said lights can be adjusted by an operator adjusting the resistance of said rheostat.

4,167,784

AVERAGE-MODE TRAFFIC CONTROL SYSTEM

Marshall B. McReynolds, and Jack D. Van Tilbury, both of Arlington, Va., assignors to Trac Incorporated, Alexandria, Va.

Filed Oct. 19, 1977, Ser. No. 843,730
Int. Cl.[2] G06F *15/48*; G08G *1/08*
U.S. Cl. 364—436 **12 Claims**

1. Apparatus for controlling a plurality of traffic signal lights at a plurality of intersections along a roadway, said apparatus operable in an average mode of operation to substantially equally favor traffic flow in each of two directions along said roadway, said apparatus comprising:

(a) data processing means including a central processing unit, data memory storage means and program memory storage means,

(b) input means operably connected to and cooperating with said data processing means for generating signals corresponding to directional offset times for each of said intersections, said directional offset times proportional to the distance of said intersection from a reference intersection,

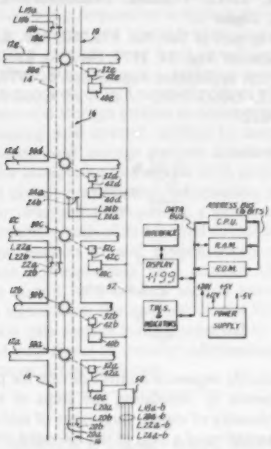
(c) said data processing means operable, under program control,

(i) for dividing a reference cycle length time into each of said directional offset times for determining a remainder fraction of said division for each of said intersections, and

(ii) for selecting average-mode offset times for said intersections from one of the group of zero percent and fifty

percent of said reference cycle length times in accordance with the values of said remainder fractions, and

(d) interface means cooperating with said data processing



means for controlling said traffic signal lights by utilizing said selected average-mode offset times as offset values with respect to said reference intersection in said average mode of operation.

4,167,785

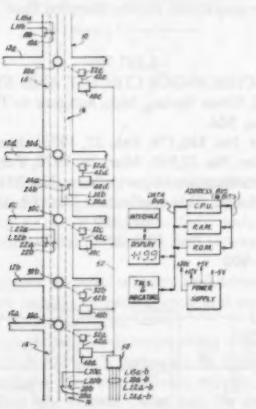
TRAFFIC COORDINATOR FOR ARTERIAL TRAFFIC SYSTEM

Marshall B. McReynolds; Jack D. Van Tilbury, both of Arlington, Va., and Irving S. Oscar, Washington, D.C., assignors to Trac Incorporated, Alexandria, Va.

Filed Oct. 19, 1977, Ser. No. 843,729

Int. Cl.[2] G06F *15/48;* G08G *1/08*

U.S. Cl. 364—437 **119 Claims**



1. A coordinator for use with a plurality of controllers for coordinating traffic at least along an artery, each controller associated with a side street intersection for controlling traffic signals at said intersection, said coordinator comprising:

(a) means for storing a plurality of values corresponding to cycle lengths, said cycle length values associated with platoons of traffic moving along said artery, and

(b) means connected to said storing means for retrieving said cycle length values and for sequentially controlling each of said plurality of controllers in an individual manner to effect said retrieved cycle length values at each associated intersection as said platoons of vehicles move along associated intersections of said artery to thereby coordinate said controllers and traffic along said artery.

119. A traffic coordinator for use on a roadway having a plurality of intersections and traffic lights and means for sensing vehicle traffic along said roadway, said sensing means including means for generating signals indicative of said sensed traffic, said coordinator comprising:

(a) a master unit comprising:

(i) input interface means for receiving said signals,

(ii) data processing means connected to said input interface means, said data processing means including a microprocessor, data memory storage means and program memory storage means for programming said microprocessor, said data processing means operable for calculating a cycle length value in response to said received signals and for generating cycle length signals corresponding thereto,

(iii) output interface means connected to said data processing means for transmitting said cycle length signals,

(b) a plurality of secondary units, one secondary unit associated with each of said intersections along said roadway and associated with an offset time from a preselected reference, each secondary unit comprising:

(i) input interface means operable for receiving said transmitted cycle length signals from said master unit,

(ii) data processing means connected to said input interface means of said secondary unit and including a microprocessor, data memory storage means and program memory storage means for programming said microprocessor, said data processing means of said secondary unit operable for storing representations of said cycle length signals and for retrieving same in the order of storage for generating force-off command signals corresponding to said cycle length signals at time determined by said associated offset times, and

(iii) output interface means connected to said data processing means of said secondary unit for receiving said force-off command signals and for applying same to actuate traffic lights at said associated intersections.

4,167,786

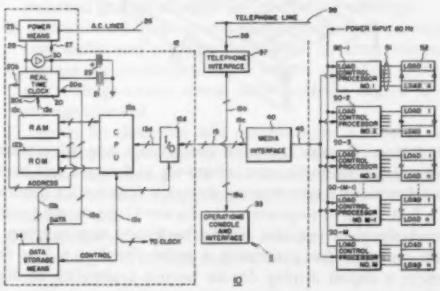
LOAD CONTROL PROCESSOR

Edward B. Miller, and Charles W. Eichelberger, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 24, 1978, Ser. No. 871,988

Int. Cl.[2] G01R *21/00;* H04Q *9/00*

U.S. Cl. 364—493 **11 Claims**



1. A load control processor for establishing the energy consumption state of each of at least one load-controlling relay coupled thereto, comprising:

means for receiving a data transmission having at least one bit of data sent in a data-error-detecting format;

first means for driving each load-controlling relay to one of an enabled and a disabled state;

means for establishing a unique address for said load control processor;

receiver-decoder means comprising second means coupled to said data transmission receiving means for storing the information in said data transmission, said transmission sequentially containing an address information portion and a load-control information portion;

third means coupled to said second means for detecting, in accordance with the error-detecting code format used, a data error in any bit of data in each of the received address and load-control portions of the transmitted information;

fourth means for comparing the transmitted address information with the unique address established for said load control processor;

fifth means for enabling said first means in accordance with the load-control information stored in said second means to cause said relays to be enabled or disabled responsive thereto;

sixth means for resetting said second through fifth means if said third means detects an error in the information received by the load control processor; and

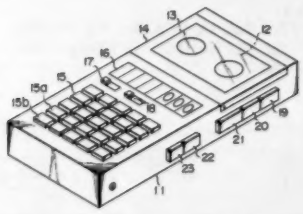
seventh means for supplying operating potential to said first means and said receiver-decoder means.

4,167,787

TAPE RECORDER APPARATUS WITH A TAPE-RUNNING DIRECTION DISPLAY

Ken Satoh, and Norio Fukuoka, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1977, Ser. No. 855,560
Claims priority, application Japan, Nov. 30, 1976, 51-143586
Int. Cl.[2] G06F *15/02*; G11B *1/04*
U.S. Cl. 364—705 **9 Claims**



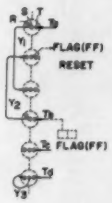
1. A tape recorder apparatus comprising: tape drive means for running a magnetic tape selectively in forward and backward directions; a tape-running direction detector for generating a first signal in response to the forward tape-running and a second signal in response to the backward tape-running; a pulse generator for generating a pulse signal at a low frequency; a digital display device having a plurality of digit display sections; and a display drive means connected to said pulse generator and said digital display device for driving the digit display sections sequentially in synchronism with the pulse signal of said pulse generator in a first direction corresponding to the forward tape-running direction in response to the first signal and in a second direction corresponding to the backward tape-running direction in response to the second signal.

4,167,788

PROGRAMMABLE SEQUENCE CONTROL DEVICE SIMULATING FLOW CHART SEQUENCES

Junichi Senba, 32-12, 1-chome, Minami-urawa, Urawa-shi, Saitama-ken, Japan

Continuation-in-part of Ser. No. 673,050, Apr. 2, 1976. This application Aug. 24, 1977, Ser. No. 827,352
Claims priority, application Japan, Apr. 5, 1975, 50-40825
Int. Cl.[2] G06G *7/00, 7/06, 7/48*; G06J *1/00*
U.S. Cl. 364—802 **8 Claims**



1. A programable sequence control device for programming a control sequence by simulating the steps of a flow chart, comprising a plurality of stages, each stage of said device being visually representative of a step of the intended flow chart and being selectively wired to other stages for simulating said flow chart, said stages comprising:

three contact points representing output terminal, address terminal and jumping control terminal, and

a logic control circuit connected between each two stages at the respective contact points, said logic control circuit comprising:

first logic means producing a first output signal based on the combination of the signals at the output terminal and jumping control terminal of a first said stage, and second logic means responsive to an address signal applied to the address terminal of another one of said plurality of stages for producing a further output signal applied at the output terminal of said another one of said plurality of stages,

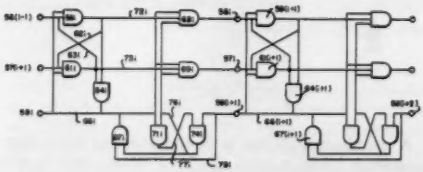
whereby upon application of a starting command at a selected stage, the stages sequence through the steps simulating the operations of the intended flow chart.

4,167,789

ASYNCHRONOUS CIRCUIT AND SYSTEM

Carlo Faustini, Silver Spring, Md., assignor to The Aiken Fund, Inc., Towson, Md.

Division of Ser. No. 336,176, Feb. 27, 1973, abandoned, which is a division of Ser. No. 22,991, Mar. 26, 1970, Pat. No. 3,757,231, which is a continuation-in-part of Ser. No. 816,573, Apr. 16, 1969, abandoned. This application Oct. 14, 1975, Ser. No. 622,389
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—900 **12 Claims**



1. An asynchronous circuit comprising a storage section, an output gate section and a control section, said storage section having multistable gate means providing at least three stable states, at least two information states and a neutral state; said control section having a first stable state; a number of information output leads equal in number to the number of information states of said storage section; said gate section being disposed

between said storage section and said output leads; said gate section being responsive to signals developed by said control section when in said first stable state to develop on said output leads, signals indicative of the state of said storage section; means for switching said control section to an unstable state; said gate section being responsive to signals developed by said control section when in said unstable state to cause said gate section to develop on said output leads signals indicative of the neutral state of said storage section; said storage section including means responsive to said unstable state of said control section to cause said storage section to assume its neutral state, means for causing said control section to assume a further stable state when said storage section assumes said neutral state, means for interfacing said circuit with an external circuit whereby said circuit may receive information in serial form, said means for interfacing comprising a gate section disposed between information leads of an external circuit and input leads to said storage section of said asynchronous circuit, and a control section corresponding to a control section of said asynchronous circuit, said control section having means responsive to a signal from the external circuit for generating a gate signal, said gate section being connected to be responsive to at least said gate signal to transfer information to said input leads of said asynchronous circuit.

4,167,790

MAGNETIC BUBBLE DOMAIN GATE ARRANGEMENT

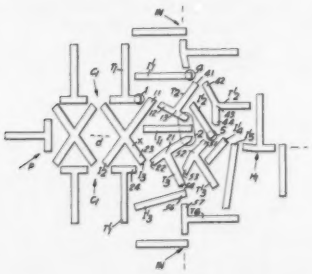
Walter L. M. C. Nuyts, Mariakerke, and Roger A. Vlaeminck, Wondelgem, both of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 14, 1977, Ser. No. 815,639

Claims priority, application Netherlands, Jul. 28, 1976, 7608351

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—15 **12 Claims**



1. An arrangement for single wall magnetic domains which are created in said arrangement by means of a magnetic field and which only exist for magnetic field values comprised between two different values thereof, said arrangement including:

a sheet of magnetic material wherein said domains are generated and are capable of propagation and containing;

a plurality of co-planar paths;

means for propagating said domains along said paths, at least three of which having a path part in proximity of each other whereby a magnetic domain moving on said path part of a first one of said paths may be deviated into a second one of said paths due to the mutual repelling force of said magnetic domain and a second magnetic domain on said third path part; wherein the distance between said path parts of said first and third paths in proximity of said second path is at most equal to three times the mean dimension of said magnetic domain and wherein the distance covered by said first magnetic domain when deviated from said path part of said first path into said second path is substantially equal to the mean dimension of said magnetic domain in a direction perpendicular to said plane of movement of said domains and being defined by a magnetic field value which is the arithmetic mean value of said two different values.

4,167,791

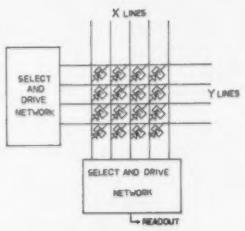
NON-VOLATILE INFORMATION STORAGE ARRAYS OF CRYOGENIC PIN DIODES

Jayanth R. Banavar, 5604 5th Ave., #106, Pittsburgh, Pa. 15232; Darryl D. Coon, 6354 Morrowfield Ave., Pittsburgh, Pa. 15217, and Gustav E. Derkits, Jr., 4531 Forbes Ave., Apt. 608, Pittsburgh, Pa. 15213

Filed Jan. 25, 1978, Ser. No. 872,303

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—175 **31 Claims**



17. A non-volatile memory device, comprising:

A. a storage element which includes a rectifying region, having a plurality of long-lived states within a predetermined range of temperatures, said element being switchable from a first long-lived state to a second long-lived state on applying a voltage-sweep across said rectifying region in the reverse bias direction, said voltage-sweep consisting of a voltage which changes from an initial voltage within a known range to at least a predetermined critical reverse bias voltage V_p which is less than the reverse breakdown voltage of said rectifying region and around which reverse bias voltage V_p a current pulse is produced by the storage element during switching, the current pulse being indicative of the state which the switched storage element was in before switching;

B. means for maintaining said storage element at a temperature within said predetermined range of temperatures;

C. means for producing said voltage-sweep and applying said voltage-sweep across said rectifying region of the storage element;

D. means for detecting said current pulse associated with switching the storage element for ascertaining the state which said storage element was in before switching, thereby to read out any information stored in the storage element; and

E. means for writing information into the storage element by switching said storage element into a selected one of said long-lived states.

DESIGN PATENTS

GRANTED SEP. 11, 1979

ERRATA

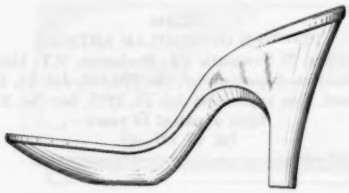
For CLASS	See PATENT NO.
D21–134	252,892
D03–053	252,895

DESIGNS

SEPTEMBER 11, 1979

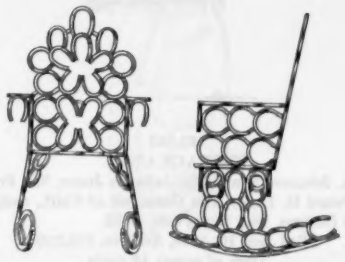
252,836
FOOTWEAR SOLE
Henrietta S. Picker, Pound Ridge, N.Y., assignor to Gran-Sol, Inc., Atlanta, Ga.
Filed May 4, 1977, Ser. No. 793,901
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322

252,837
SHOE BOTTOM
Charles J. Cole, c/o El Greco Leather Products 85 N. Third St., Brooklyn, N.Y. 11211
Filed Aug. 4, 1977, Ser. No. 821,901
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—322

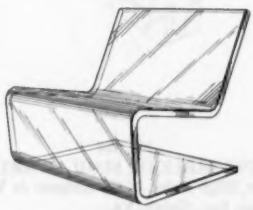


252,838
BELT BUCKLE
Ryk Van Brouwer, Los Angeles, Calif., assignor to Raintree Buckle & Jewelry, Inc., Los Angeles, Calif.
Filed Oct. 28, 1977, Ser. No. 846,614
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—431

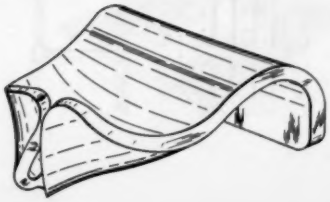
252,839
ROCKING CHAIR
Ruben G. Ortiz, Hwy. 4, Sims Rd., Brentwood, Calif. 94513
Filed Sep. 21, 1977, Ser. No. 835,451
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



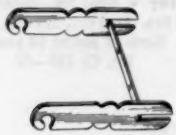
252,840
CHAIR OR THE LIKE
Menno Scholten, 2500 N. Lakeview, Chicago, Ill. 60614
Filed Mar. 28, 1977, Ser. No. 781,727
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



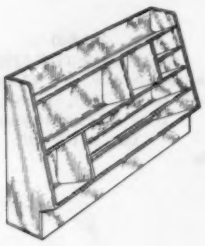
252,841
SOAP DISH
John K. Koh, 2593 Esch Ave., Ann Arbor, Mich. 48104
Filed May 30, 1978, Ser. No. 910,586
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—89



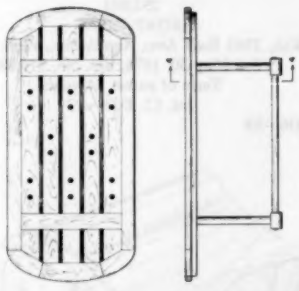
252,842
PAPER ROLL HOLDER
Raymond J. McKee, Box 246, Wayne, N.J. 07470
Filed Feb. 16, 1978, Ser. No. 878,663
Term of patent 14 years
Int. Cl. D23—*02;* D6—*04*
U.S. Cl. D6—97



252,843
STORAGE UNIT
Barrett A. Johnson, Sunnyvale; Julianne Jones, San Francisco, and Edward D. Lucey, Los Gatos, all of Calif., assignors to Spacial Designs, Inc., Sunnyvale, Calif.
Filed Jun. 16, 1978, Ser. No. 916,010
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—135

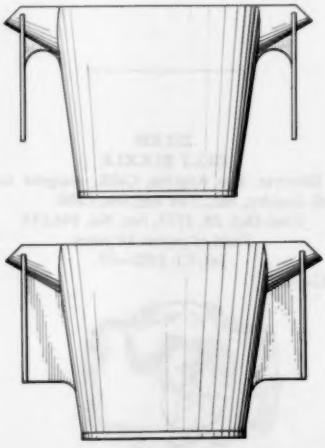


252,844
DINING TABLE OR SIMILAR ARTICLE
Huey T. Keiler, High Point, N.C., assignor to Vaughan Furniture Company, Inc., Galax, Va.
Filed Aug. 8, 1977, Ser. No. 822,610
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

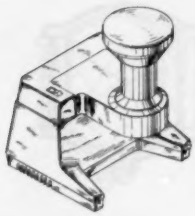


252,845
COFFEE FILTER
Thomas W. Gavin, 3380 Merrick Rd., Seaford, N.Y. 11783
Filed Oct. 13, 1977, Ser. No. 841,893
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—47

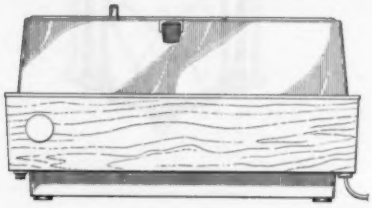
252,846
PITCHER OR SIMILAR ARTICLE
Paul J. Miller, 75 Newcastle Rd., Rochester, N.Y. 14610
Continuation-in-part of Ser. No. 595,409, Jul. 14, 1975, abandoned. This application Jul. 21, 1977, Ser. No. 817,608
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—64



252,847
FOOD GRINDER
Thomas G. Cannon, Ft. Collins, Colo., and Frederick G. Mackay, Tarzana, Calif., assignors to Teledyne Industries, Inc., Ft. Collins, Colo.
Filed Apr. 28, 1977, Ser. No. 792,034
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—155

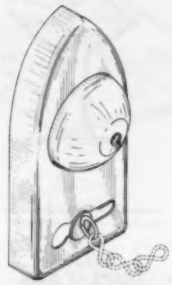


252,848
RECORD CLEANER
Richard O. Spencer, 18 Viejo, Irvine, Calif. 92715
Filed Jun. 16, 1977, Ser. No. 808,481
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—161

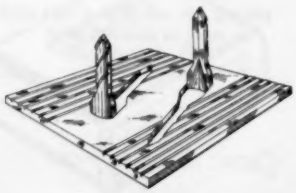


252,849
CONTAINER OPENING TOOL
Irwin D. Weiss, 9821 Layton Rd., Philadelphia, Pa. 19115
Filed May 20, 1977, Ser. No. 798,919
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D8—18

252,850
BURGLAR ALARM
Clarence W. Jorgensen, deceased, late of Gurnee, Ill., and by Elva M. Jorgensen, executrix, 5023 Darlene Dr., Gurnee, Ill. 60031
Filed Jun. 29, 1977, Ser. No. 811,996
Term of patent 14 years
Int. Cl. D8—*07*; D10—*05*
U.S. Cl. D8—332

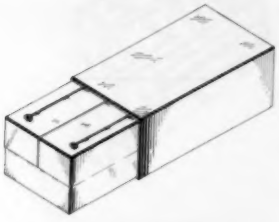


252,851
TWO PRONG SQUARE FLAT HEAD NAIL
Donald R. Church, Denton County, Tex., assignor to Church & Clark, Inc., Dallas, Tex.
Continuation-in-part of Ser. No. 672,116, Mar. 31, 1976, abandoned. This application Mar. 31, 1977, Ser. No. 783,160
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—389

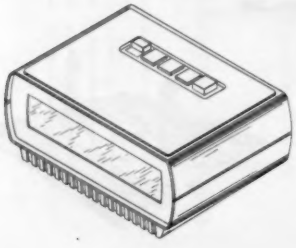


252,852
BOTTLE
Mark S. Lang, 6947 Country Club Dr., La Jolla, Calif. 92037
Filed Nov. 1, 1976, Ser. No. 737,537
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—82

252,853
DISPLAY BOX
Martin B. Perkins, 3304 Lafayette, Omaha, Nebr. 68131
Filed May 11, 1977, Ser. No. 795,971
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—221



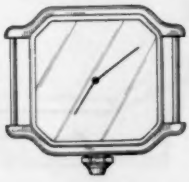
252,854
DIGITAL CLOCK
Nicholas F. Talesfore, 1732 Frobisher Way, San Jose, Calif. 95124
Filed Aug. 2, 1977, Ser. No. 821,254
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15



252,855
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Les Must de Cartier-France, Paris, France
Filed May 16, 1977, Ser. No. 797,571
Claims priority, application France, Nov. 15, 1976, 76 75218
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

252,856
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Les Must de Cartier-France, Paris, France
Filed May 16, 1977, Ser. No. 797,572
Claims priority, application France, Nov. 15, 1976, 76 75218
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

252,857
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Les Must de Cartier-France, Paris, France
Filed May 16, 1977, Ser. No. 797,573
Claims priority, application France, Nov. 15, 1976, 76 75218
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

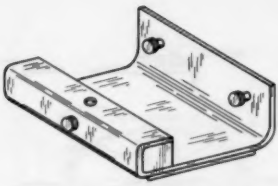


252,858
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Les Must de Cartier-France, Paris, France
Filed May 16, 1977, Ser. No. 797,574
Claims priority, application France, Nov. 15, 1976, 76 75218
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

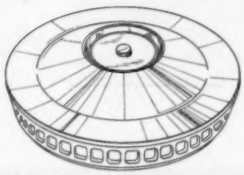
252,859
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Les Must de Cartier-France, Paris, France
Filed May 16, 1977, Ser. No. 797,575
Claims priority, application France, Nov. 15, 1976, 76 75218
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

252,860
WATCH
Alain D. Perrin, Rueil-Malmaison, France, assignor to Les Must de Cartier-France, Paris, France
Filed May 16, 1977, Ser. No. 797,577
Claims priority, application France, Nov. 15, 1976, 76 75218
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—39

252,861
BASE FOR A pH METER ELECTRODE ARM
Robert S. Potts, Sherborn, Mass., assignor to Corning Glass Works, Corning, N.Y.
Filed Jan. 3, 1977, Ser. No. 756,478
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—94



252,862
COMBINED SMOKE AND FIRE ALARM OR THE LIKE
Spencer L. Mackay, Canoga Park, Calif., assignor to Teledyne Industries, Inc., Ft. Collins, Colo.
Filed Sep. 19, 1977, Ser. No. 834,372
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



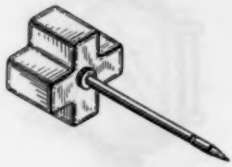
252,863
NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Suite 300, Palm Beach, Fla. 33480
Filed Oct. 3, 1977, Ser. No. 838,933
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—6

252,864
NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Suite 300, Palm Beach, Fla. 33480
Filed Oct. 3, 1977, Ser. No. 838,934
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—6

252,865
NECKLACE OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Suite 300, Palm Beach, Fla. 33480
Filed Oct. 3, 1977, Ser. No. 838,939
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—6

252,866
DIAMOND RING
Josef J. Barr, 125 Worth Ave., Suite 300, Palm Beach, Fla. 33480
Filed Oct. 25, 1977, Ser. No. 844,695
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

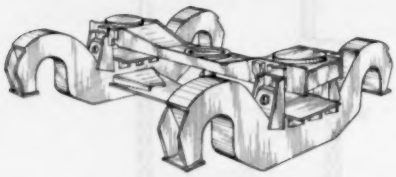
252,867
EAR-PIERCING EARRING
Samuel Mann, Englewood, N.J., assignor to Inverness Corporation, Englewood, N.J.
Division of Ser. No. 855,599, Nov. 28, 1977. This application Sep. 21, 1978, Ser. No. 944,468
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—76



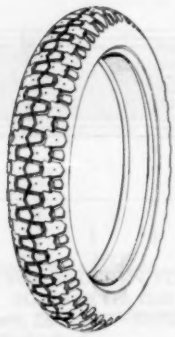
252,868
PENDANT
Penny Cunningham, 1601 Farrington Rd., Philadelphia, Pa. 19151
Filed Jul. 26, 1977, Ser. No. 819,212
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—96

252,869
FLOWER POT OR THE LIKE
Ted Dziewulski, Bartlett, Ill., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Sep. 1, 1977, Ser. No. 829,750
The portion of the term of this patent subsequent to Nov. 2, 1990, has been disclaimed.
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155

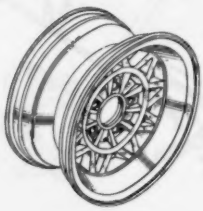
252,870
RAILWAY CAR TRUCK
Gerald D. Garner, Florissant; James C. Hammonds; Jan D. Holt, both of St. Charles, and Conway H. Melcher, Kirkwood, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.
Filed Aug. 3, 1977, Ser. No. 821,383
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—46



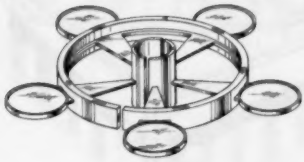
252,871
TIRE
Barrington S. Gill, and Claude A. Hart, both of Sutton Coldfield, England, assignors to Dunlop Limited, Great Britain
Filed Nov. 7, 1977, Ser. No. 849,218
Claims priority, application United Kingdom, May 7, 1977, 979950/77
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



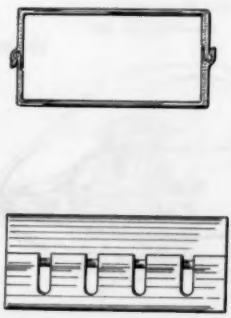
252,872
WHEEL
Merlyn R. Reppert, Rancho Palos Verdes, Calif., assignor to W. R. Grace & Co.
Filed Apr. 24, 1978, Ser. No. 899,609
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



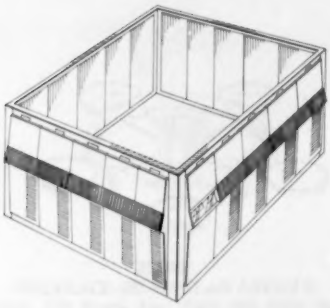
252,873
SPINNER FOR BIKE HUB
Kenneth N. Finkenbiner, Dallas, Tex., assignor to Ken-Neil, Inc., Dallas, Tex.
Filed Feb. 23, 1978, Ser. No. 880,847
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—213



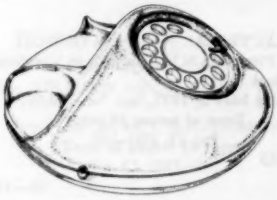
252,874
ELECTRICAL WIRING CONDUIT
Ralph D. Neff, Pittsfield, N.H., assignor to Vernitron Corporation, Great Neck, N.Y.
Filed May 5, 1977, Ser. No. 793,967
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—13

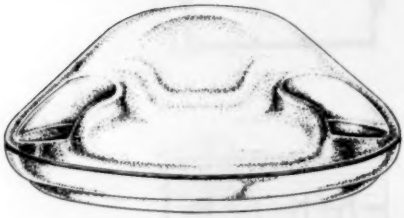


252,875
FACADE FOR ENCLOSING DATA PROCESSING APPARATUS OR THE LIKE
George R. Daniels, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.
Filed Aug. 25, 1977, Ser. No. 827,486
Term of patent 7 years
Int. Cl. D14—*02;* D13—*03*
U.S. Cl. D14—40

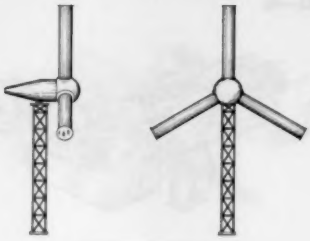


252,876
BASE FOR TELEPHONE SET
Clifford D. Read, Almonte; Robert E. Hillmer, Carleton Place, and John F. Tyson, Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada
Filed Sep. 19, 1977, Ser. No. 834,824
Claims priority, application Canada, Jui. 20, 1977, 2007771
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

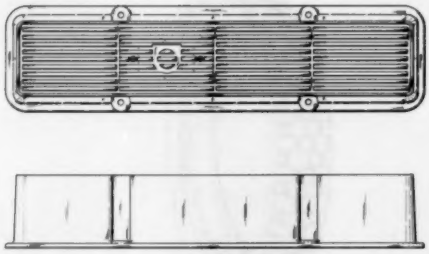




252,877
WIND TURBINE
Thomas F. Hanson, 24204 Heritage La., Newhall, Calif. 91321
Filed Jan. 31, 1977, Ser. No. 764,188
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D15—1



252,878
VALVE COVER FOR AN ENGINE
Ralph R. Bellino, Cleveland, Ohio; John B. Foster, Los Altos, and James R. Powers, Los Angeles, both of Calif., assignors to W. R. Grace & Co.
Filed Jun. 15, 1977, Ser. No. 806,646
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—5



252,879
ELECTRIC POWERED EARTH TILLER
William R. Lessig, III, Towson; Roderick F. Bunyea, Cockeysville, and Allen G. Beares, Towson, all of Md., assignors to Black & Decker Inc., Newark, Del.
Filed Aug. 22, 1977, Ser. No. 826,688
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—12

252,880

HOUSING FOR AN APPARATUS FOR ROUGHENING AND CLEANING A SURFACE OF THE LIKE

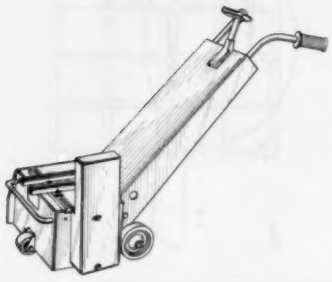
Paul Dummermuth, Zunzgen, Switzerland, assignor to Von Arx AG, Sissach, Switzerland

Filed May 13, 1977, Ser. No. 796,559

Term of patent 14 years

Int. Cl. D15—*05*

U.S. Cl. D15—48



252,881

APPARATUS FOR ROUGHENING AND CLEANING A SURFACE OR THE LIKE

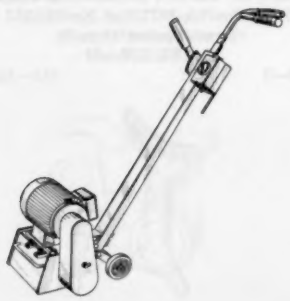
Paul Dummermuth, Zunzgen, Switzerland, assignor to Von Arx AG, Sissach, Switzerland

Filed May 13, 1977, Ser. No. 796,802

Term of patent 14 years

Int. Cl. D15—*05*

U.S. Cl. D15—48



252,882

SPECTACLES FRAME FRONT

David W. Johnsen, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Sep. 13, 1977, Ser. No. 832,773

Term of patent 14 years

Int. Cl. D16—*06*

U.S. Cl. D16—65

252,883

PENCIL SHARPENER

Manuel Maté Balmes, Valencia, Spain, assignor to Playme, S.A., Beniparrell, Spain

Filed May 18, 1977, Ser. No. 798,026

Claims priority, application Spain, Dec. 21, 1976, 88.690

Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—73

252,884

PENCIL SHARPENER

Manuel Maté Balmes, Valencia, Spain, assignor to Playme, S.A., Beniparrell, Spain

Filed May 18, 1977, Ser. No. 798,028

Claims priority, application Spain, Dec. 21, 1976, 88.690

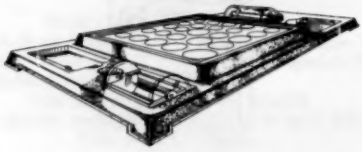
Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—73

252,885
PENCIL SHARPENER
Manuel Maté Balmes, Valencia, Spain, assignor to Playme, S.A., Beniparrell, Spain
Filed May 18, 1977, Ser. No. 798,029
Claims priority, application Spain, Dec. 21, 1976, 88.690
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—73

252,886
GAME BOARD
Shihei Kakinuma, Tokyo, Japan, assignor to Kabushiki Kaisha A-One, Japan
Filed May 12, 1977, Ser. No. 796,204
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—33



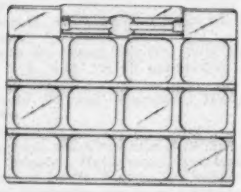
252,887
LAUNCHER FOR A TOY GLIDER
Michael R. Meyers, Trumbull; John A. Vernon, Bethel, both of Conn., and Dorland L. Crosman, Glen Ridge, N.J., assignors to Louis Marx & Co., Inc., Stamford, Conn.
Filed Jul. 22, 1977, Ser. No. 818,182
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—91

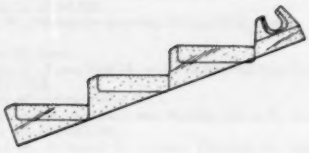
252,888
GAME RACKET
Ronald B. Jones, Washington, D.C., assignor to Pap-et, Inc., Washington, D.C.
Filed Aug. 17, 1977, Ser. No. 825,247
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—213

252,889
TOILET SEAT ACCESSORY
Willie Hempstead, 4017 Adair St. #1, Los Angeles, Calif. 90011
Filed Sep. 19, 1977, Ser. No. 834,384
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71

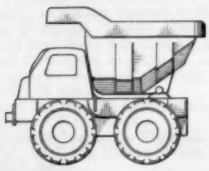
252,890
MASCARA SHIELD
Wanda Cavalieri, 607 Lee Dr., Broomall, Pa. 19008
Filed Nov. 16, 1977, Ser. No. 852,142
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—7

252,891
TRAY FOR COSMETICS
Charles Stutzer, 745 5th Ave., New York, N.Y. 10022
Filed Jul. 21, 1977, Ser. No. 817,890
Term of patent 7 years
Int. Cl. D28—*03*
U.S. Cl. D28—76

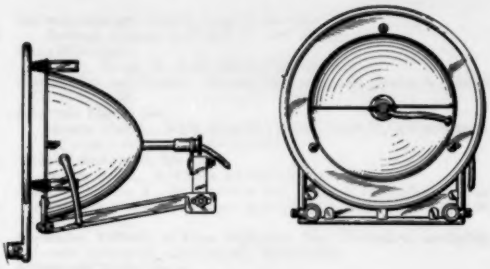




252,892
TOY VEHICLE
Terada Shigenori, Tokyo, Japan, assignor to Tomy Kogyo, Co., Inc., Tokyo, Japan
Filed Aug. 4, 1977, Ser. No. 821,624
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134

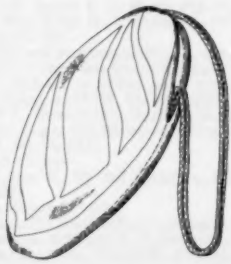


252,893
SPOTLIGHT
Charles W. Altman, 5 Rudolph Ter., Yonkers, N.Y. 10701
Filed Aug. 12, 1977, Ser. No. 824,059
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—20 K



252,894
HOUSING FOR YARD LIGHT
Minas P. Hazerjian, 72 Stivaletta Dr., Dedham, Mass. 02026, and Kevork Hazerjian, 19 Woodard Rd., West Roxbury, Mass.
Filed Mar. 28, 1977, Ser. No. 753,534
Term of patent 14 years
Int. Cl. D26—*03, 05*
U.S. Cl. D48—38

252,895
HANDBAG
Thomas L. Ahern, San Francisco, Calif., assignor to Darrel R. Schoon, San Francisco, Calif, a part interest
Filed Nov. 8, 1976, Ser. No. 740,051
Term of patent 3½ years
Int. Cl. D3—*01*
U.S. Cl. D3—53



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TO WHOM

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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A/S Raufoss Ammunisjonsfabrikker: *See*—
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Braugenhardt, Anders E. S.; Hedin, Nils A.; Odhelius, Gustaf H. V.; and Anas, Johan O., 4,167,652, Cl. 179-15.0AT.

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ganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.

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Bergman, Gunnar B., to SeaTek Corp. Method and apparatus for stabilizing a floating structure. 4,167,147, Cl. 114-122.000.

Bergstrom, Sven I.: *See*—
Hagg, Per B.; Bergstrom, Sven I.; Lundmark, Lars E.; and Hedberg, Carl-Erik L., 4,167,378, Cl. 425-82.100.

Berstein, Garrj; and Naumann, Hans J., to Wilhelm Hegenscheidt GmbH. Method and apparatus for finish rolling workpieces of substantially circular cross-section to a selected diameter. 4,167,106, Cl. 72-21.000.

Bertea Corporation: *See*—
Lindsey, Charles T., 4,167,135, Cl. 92-61.000.

Bertolacini, Ralph J.; Kim, Dae K.; and Lehmann, Gerald M., to Standard Oil Company (Indiana). Process for the disproportionation of petroleum hydrocarbons. 4,167,530, Cl. 585-475.000.

Bertus, Brent J.; and McKay, Dwight L., to Phillips Petroleum Co. Passivating metals on cracking catalysts. 4,167,471, Cl. 208-74.000.

Besha, James A. Open-channel flow control system. 4,167,358, Cl. 405-87.000.

Besik, Ferdinand. Process for purifying waste waters. 4,167,479, Cl. 210-7.000.

Best, Donald T., to Sperry Rand Corporation. Precedent and subsequent minor transitions to alleviate pulse crowding. 4,167,761, Cl. 360-45.000.

Betz, Joseph R.: *See*—
Petro, Michael; Betz, Joseph R.; and DeArmitt, Duane W., 4,167,361, Cl. 405-290.000.

Beutler, Helmut: *See*—
Engelhardt, Friedrich; Hintermeier, Karl; Ribka, Joachim; and Beutler, Helmut, 4,167,395, Cl. 8-173.000.

Beveridge, Robert L. W., to Imperial Chemical Industries Limited. Dowel device for grouting in a drillhole. 4,167,359, Cl. 405-259.000.

Biagi, Alvaro D., to Kree Institute of Electrolysis, Inc. Dual epilation machine. 4,167,187, Cl. 128-303.130.

Bicosa Societe de Recherches: *See*—
Courier de Mere, Henri E., 4,167,767, Cl. 361-256.000.

Bihler, Otto. Feeding apparatus for stepwise feeding of continuous elongated material. 4,167,239, Cl. 226-150.000.

Billenstein, Seigfried; Brecht, Heinz; and Hoffmann, Dieter, to Hoechst Aktiengesellschaft. Fluorinated sulfosuccinates. 4,167,639, Cl. 560-151.000.

Bindin, Peter J., to Chloride Silent Power Limited. Metal-to-ceramic seals. 4,167,351, Cl. 403-30.000.

Bird, Colin L.: *See*—
Barclay, Donald J.; Bird, Colin L.; and Lowe, Anthony C., 4,167,308, Cl. 350-357.000.
Barclay, Donald J.; Bird, Colin L.; Lowe, Anthony C.; and Martin, David H., 4,167,309, Cl. 350-357.000.

Biserod, Hans B., to A/S Raufoss Ammunisjonsfabrikker. Projectile for scattering of a load. 4,167,140, Cl. 102-66.000.

Bitterberg, Friedhelm, to Thyssen Industrie Aktiengesellschaft. Pneumatic bogie pitch stabilizer. 4,167,143, Cl. 105-164.000.

Boden, Karl; Fremerey, Johan K.; Comsa, George; Gudden, Friedrich; Appelt, Gunther; Friedel, Rudolf; and Geldner, Ernst, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung; and Siemens Aktiengesellschaft. Rotary anode X-ray tube. 4,167,671, Cl. 250-406.000.

Bodle, Ronald L.; and Dolby, Gareth B., to Moore Industries Inc. Two-wire frequency to DC converter. 4,167,706, Cl. 328-26.000.

Boehlje, Robert D.: *See*—
Beccia, Anthony R.; Boehlje, Robert D.; Jacobsen, Peter T.; and Olney, Richard, 4,167,781, Cl. 364-200.000.

Boehringer Ingelheim GmbH: *See*—
Schmidt, Gunther; Puschmann, Sigfrid; and Engelhardt, Gunther, 4,167,570, Cl. 424-256.000.

Boeing Company, The: *See*—
Cooper, Leslie E.; and Geitham, Glenn A., 4,167,066, Cl. 33-174.00P.

Bogdanovich, Evgeny A.: *See*—
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.

Bognar, Rezso; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, to Chinoin Gyogyszer es Vegyeszeti. 7,8-Dihydroisomorphine derivative, namely azidoethylmorphine. 4,167,636, Cl. 546-46.000.

Bollinger, Joseph M., to Rohm and Haas Company. Polymerization with diborane adducts or oligomers of boron-containing monomers. 4,167,616, Cl. 526-197.000.

Bolto, Brian A.; and Eppinger, Kurt H., to ICI Australia Limited. Ion exchange products and processes using crosslinked allylamine copolymers. 4,167,610, Cl. 521-31.000.

Bolus, Daniel M. A. F.; Chevillon, Jean P.; Conte, Jean C.; and Philippe, Pierre D. P., to International Standard Electric Corporation. Telephone line feeding circuit including a protective device. 4,167,654, Cl. 179-81.00R.

Bond, Charles E., to Coca-Cola Bottling Works Company, a part interest. Solenoid enabled lock for vending machines and the like. 4,167,104, Cl. 70-208.000.

Bondarenko, Tamara S.: *See*—
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280

Borner, Raoul. Installation for burning materials. 4,167,390, Cl. 432-58.000.

Borowiak, Marek: *See*—
Czarnecki, Lech; Lyczkowski, Mariusz; and Borowiak, Marek, 4,167,611, Cl. 521-88.000.

Boschert Associates: *See*—
Forge, Charles O., 4,167,719, Cl. 336-77.000.

Boucher, Frederic B.: *See*—
Wahl, Edward F., III; and Boucher, Frederic B., 4,167,099, Cl. 60-641.000.

Bourzat, Jean D.; Farge, Daniel; Leger, Andre; and Ponsinet, Gerard, to Rhone-Poulenc Industries. Thiazoline derivatives. 4,167,571, Cl. 424-263.000.

Bouteille, Daniel, to La Telemechanique Electrique. Distribution device for a pneumatic installation. 4,167,200, Cl. 137-884.000.

Bowen, Terry P.; Hoover, Charles D.; Ferdon, Gilbert D.; and Harwood, Robert G., to AMP Incorporated. Light transmitting fiber cable connector. 4,167,303, Cl. 350-96.210.

Bozzuto, Carl R.: *See*—
Mehta, Arun K.; Bozzuto, Carl R.; and Kantesaria, Prabhudas P., 4,167,578, Cl. 423-235.000.

Brandenstein, Manfred: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,167,220, Cl. 175-337.000.

Branson, Stephen G.: *See*—
Godec, Max; and Branson, Stephen G., 4,167,280, Cl. 292-92.000.

Braugenhardt, Anders E. S.; Hedin, Nils A.; Odhelius, Gustaf H. V.; and Anas, Johan O., to Telefonaktiebolaget L M Ericsson. Method and apparatus for the interchanges of PCM word. 4,167,652, Cl. 179-15.0AT.

Braumann, Gundokar; and Schon, Adolf, to Siemens Aktiengesellschaft. Electromagnetic relay. 4,167,717, Cl. 335-202.000.

Brecht, Heinz: *See*—
Billenstein, Seigfried; Brecht, Heinz; and Hoffmann, Dieter, 4,167,639, Cl. 560-151.000.

Breig, John W.: *See*—
Donnelly, Donald E.; Breig, John W.; and Gellner, Robert L., 4,167,389, Cl. 431-79.000.

Brendle, Ralph N., to Milliken Research Corporation. Ester capped alkyleneoxy fugitive tints and method for producing same. 4,167,510, Cl. 260-174.000.

Britax (Wingard) Limited: *See*—
Longland, Peter A., 4,167,306, Cl. 350-289.000.

Brjukhov, Boris F.; Buchin, Nikolai B.; and Shilov, Vasily P., to Nauchno-Issledovatelsky I Proektno-Konstruktorsky Institut Po Dobyche. Apparatus for measuring frequency of rotation of a shaft. 4,167,119, Cl. 73-488.000.

Brobeck, Helmut, to Aktiengesellschaft Kuhnle, Kopp & Kausch. Advance diffuser apparatus for a blower having a large impeller diameter. 4,167,368, Cl. 415-162.000.

Brock, Andrew J.: *See*—
Anthony, William H.; Popplewell, James M.; and Brock, Andrew J., 4,167,410, Cl. 75-138.000.

Brodd, Ralph J.: *See*—
Louzos, Demetrios V.; and Brodd, Ralph J., 4,167,458, Cl. 204-14.00N.

Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research & Engineering Co. Heterosubstituted alkyl lactone acids, esters and amides. 4,167,514, Cl. 260-343.500.

Brown, Harry H., to General Electric Company. Compression of data on status of remote equipment. 4,167,730, Cl. 340-163.000.

Brown & Williamson Tobacco Corporation: *See*—
Jewell, John N.; Canon, Ardath B.; and Newton, Richard P., Jr., 4,167,191, Cl. 131-140.00R.

Brunk, Jack L.: *See*—
Loeffler, Romain E.; Genson, Samuel R.; and Brunk, Jack L., 4,167,404, Cl. 65-4.00R.

Brunton, Ernest W. Swimming pool wall system. 4,167,084, Cl. 52-169.700.

Brussels, Nathan E., to Solar Energy Systems, Inc. Stationary type solar energy collector apparatus. 4,167,178, Cl. 126-438.000.

Bryer, Robert P.: *See—*
Davis, Brian C.; and Bryer, Robert P., 4,167,504, Cl. 260-33.6UA.
Buchholz, Claus, to Bepex GmbH. Segment roll for a briquet or compacting roll press. 4,167,387, Cl. 425-470.000.
Buchin, Nikolai B.: *See—*
Brjukhov, Boris F.; Buchin, Nikolai B.; and Shilov, Vasily P., 4,167,119, Cl. 73-488.000.
Buckley, Ronald P.: *See—*
Attwood, Terence E.; and Buckley, Ronald P., 4,167,605, Cl. 428-419.000.
Buhler, Karl, to BBC Brown Boveri & Company, Limited. Column for supporting, raising and swivelling the roof of an arc furnace. 4,167,642, Cl. 13-14.000.
Buhrer, Erwin. Method and apparatus for the production of foundry molds. 4,167,208, Cl. 164-18.000.
Burdonos, Vitaly M.: *See—*
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.
Burek, Michael J.; and White, Robert S., to Stirling-White Company, Inc. Composite illumination fixture and control circuit therefor. 4,167,688, Cl. 315-178.000.
Burley, Joseph W., to Akzo N.V. Process for preparing organotin trihalides. 4,167,520, Cl. 260-429.700.
Burmistrova, Ljubov M.: *See—*
Rogozhin, Sergei V.; Vainerman, Efim S.; and Burmistrova, Ljubov M., 4,167,590, Cl. 426-574.000.
Burr, William F.; Rose, Neil M.; and Ackers, Stephen B., to Canica Crushers, Ltd. Lifter for rock crusher lid. 4,167,251, Cl. 241-285.00A.
Burroughs Corporation: *See—*
Flora, Laurence P., 4,167,714, Cl. 333-101.000.
Wu, Alexander C., 4,167,324, Cl. 355-3.00R.
Burrus, Thomas W., to RCA Corporation. Noise reduction apparatus. 4,167,749, Cl. 358-8.000.
Burshtein, Vladislav V.: *See—*
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.
Bury, George J., to Illinois Tool Works Inc. Adhesive fastening device. 4,167,259, Cl. 248-205.00A.
Bushinsky, Oleg A.: *See—*
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.
C.A.V. Limited: *See—*
Jarrett, Boaz A.; and Lakra, Paul, 4,167,373, Cl. 417-289.000.
Calvert, Ronald J., to Hills Industries Limited. Angle meshing gear. 4,167,127, Cl. 74-416.000.
Camus, Raymond F. E. Panel assembly and a panel element for a panel assembly. 4,167,089, Cl. 52-309.700.
Canica Crushers, Ltd.: *See—*
Burr, William F.; Rose, Neil M.; and Ackers, Stephen B., 4,167,251, Cl. 241-285.00A.
Canon, Ardath B.: *See—*
Jewell, John N.; Canon, Ardath B.; and Newton, Richard P., Jr., 4,167,191, Cl. 131-140.00R.
Canon Kabushiki Kaisha: *See—*
Ichiyanagi, Toshikazu; and Iwashita, Tomonori, 4,167,314, Cl. 354-173.000.
Sakurada, Nobuaki; Shinoda, Nobuhiko; Ito, Tadashi; Mashimo, Yukio; and Ito, Fumio, 4,167,332, Cl. 356-227.000.
Shinoda, Nobuhiko; Sakurada, Nobuaki; Kawamura, Masaharu; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,167,312, Cl. 354-23.00D.
Suzki, Akiyoshi, 4,167,677, Cl. 356-401.000.
Cantu, Arthur M.: *See—*
Koontz, Paul G.; Wright, Richard L.; and Cantu, Arthur M., 4,167,674, Cl. 250-481.000.
Cardarelli, James F. Three dimensional space viewing device. 4,167,074, Cl. 40-438.000.
Carey, Richard D., to Dayco Corporation. Electrical current-carrying fluid hose construction. 4,167,645, Cl. 174-47.000.
Caridis, Andrew A.; and Benson, Clark K., to Heat and Control, Inc. Method for heating and cooking foods in a closed treatment chamber by maintaining the temperature and moisture content. 4,167,585, Cl. 426-233.000.
Carl Still, Recklinghausen, and Bergwerksverband GmbH, Firma: *See—*
Knappstein, Johannes; Thiersch, Friedrich; Schuch, Werner; Weber, Rolf; Beck, Kurt-Gunther; and Stahlherm, Dieter, 4,167,453, Cl. 202-141.000.
Carpenter, Peter E. G.: *See—*
Baker, Andrew P.; and Carpenter, Peter E. G., 4,167,768, Cl. 361-355.000.
Carson, Don B., to UOP Inc. Isoparaffin-olefin alkylation utilizing liquefied normal paraffin concentrate in the reaction vessel. 4,167,535, Cl. 585-717.000.
Cassella Aktiengesellschaft: *See—*
Engelhardt, Friedrich; Hintermeier, Karl; Ribka, Joachim; and Beutler, Helmut, 4,167,395, Cl. 8-173.000.
Catanzarite, Vincent Owen: *See—*
Giattino, Louis R., 4,167,608, Cl. 429-196.000.
Caterpillar Tractor Co.: *See—*
Trittipoe, Jack H., 4,167,274, Cl. 280-481.000.
Chan, Hak-Foon: *See—*
Miller, George A.; and Chan, Hak-Foon, 4,167,576, Cl. 424-273.00R.
Chandler, Arthur R.; and Moody, Victor, to Weatherford/Lamb, Inc. Apparatus for imparting torsion to a tubular member. 4,167,128, Cl. 81-66.00R.
Channon, Ross T.: *See—*
Van Mannekes, Abraham; Channon, Ross T.; and De Beukelaar, Jan W., 4,167,619, Cl. 528-483.000.
Charnock, John A., to ERCO Industries Limited. Electrode joints. 4,167,643, Cl. 13-18.00C.
Chau, Set B., to Ex-Cell-O Corporation. Flexible disk transducer loading and unloading system. 4,167,766, Cl. 360-104.000.
Cheesman, William D., to Royce Equipment Company. Mounting assembly for a journal bearing. 4,167,297, Cl. 308-187.000.
Cheetham, Jeffery J. Containers. 4,167,228, Cl. 206-222.000.
Chen, Eugene H.; Saggiomo, Andrew J.; and Nodiff, Edward A., to United States of America, Army. Process for production of 8-NHR quinolines. 4,167,638, Cl. 546-171.000.
Chen, Yu-Tsai, to Standard Oil Company (Indiana). Method for heat treating shaped articles of amide-imide or amic acid polymers. 4,167,620, Cl. 528-481.000.
Cheng, Chuah C.: *See—*
Hock, Ong S.; and Cheng, Chuah C., 4,167,519, Cl. 260-428.500.
Chesbro, William R.; Eifert, Robin; and Evans, Thomas, to University of New Hampshire. Method and apparatus for the production of secondary metabolites by the maintenance-state cultivation of microorganisms. 4,167,450, Cl. 435-3.000.
Chevillon, Jean P.: *See—*
Bolus, Daniel M. A. F.; Chevillon, Jean P.; Conte, Jean C.; and Philippe, Pierre D. P., 4,167,654, Cl. 179-81.00R.
Chinoin Gyogyszer es Vegyeszeti: *See—*
Bognar, Rezso; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,167,636, Cl. 546-46.000.
Chiusoli, Gian P.: *See—*
Musco, Alfredo; Santi, Roberto; and Chiusoli, Gian P., 4,167,513, Cl. 260-343.500.
Chloride Electro Networks: *See—*
Gross, Ronald D., 4,167,680, Cl. 307-66.000.
Chloride Silent Power Limited: *See—*
Bindin, Peter J., 4,167,351, Cl. 403-30.000.
Duncan, James H., 4,167,550, Cl. 264-66.000.
Christ, Allen E.; Sprague, Dennis R.; and Ziegner, Bernhard A., to Motorola, Inc. Making hybrid IC with photoresist laminate. 4,167,413, Cl. 96-36.200.
Christenson, Dempster S.; Gordon, Michael F.; Kistler, Roland D.; Kriegler, Frank J.; Lampert, Seymour R.; Marshall, Robert E.; McLaughlin, Rowland H.; and Smith, Vernon H., to Environmental Research Institute of Michigan. Apparatus for obtaining multi-spectral signatures. 4,167,729, Cl. 340-146.3AH.
Chupurdy, Garry C. Beverage brewer. 4,167,136, Cl. 99-306.000.
Ciba-Geigy AG: *See—*
Defago, Raymond, 4,167,392, Cl. 8-2.50A.
Dodwell, Geoffrey M., 4,167,593, Cl. 427-171.000.
Ciba-Geigy Corporation: *See—*
Kormany, Geza, 4,167,628, Cl. 542-454.000.
Zussman, Hyman W.; Knell, Martin; and Dexter, Martin, 4,167,465, Cl. 204-159.150.
Ciferri, Alberto; Acierno, Domenico; and Alfonso, Giovanni C. Process of producing multi-oriented fibres and films of aliphatic polyamides. 4,167,614, Cl. 525-4.000.
Cink, Josef: *See—*
Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, 4,167,123, Cl. 74-125.500.
Cioc, Alexander: *See—*
Schwadtke, Karl; Kunzel, Werner; Weber, Rudolf; Puchta, Rolf; Cioc, Alexander; and Kik, Michael, 4,167,594, Cl. 427-242.000.
Cipriani, Cipriano. Liquid colorant/additive carrier for use in compounding polymers. 4,167,503, Cl. 260-33.20R.
Cirkler, Werner; and Krueger, Hans, to Siemens Aktiengesellschaft. Liquid crystal display device with supplementary lighting. 4,167,307, Cl. 350-345.000.
Clad Metals, Inc.: *See—*
Ulam, John B., 4,167,606, Cl. 428-653.000.
Clarridge, Glenn E., to Ford Industries, Inc. Tape deck capstan shifting apparatus. 4,167,257, Cl. 242-201.000.
Classic Products Corporation: *See—*
Fogel, Isaac, 4,167,049, Cl. 5-402.000.
Coca-Cola Bottling Works Company: *See—*
Bond, Charles E., 4,167,104, Cl. 70-208.000.

Coe, Richard H.; McQuade, Daniel J.; and Weiss, David L., to Motorola, Inc. Digital voice protection system and method. 4,167,700, Cl. 325-32.000.

Coggin, Charles H., to Nitto Boseki Co., Ltd. Apparatus and method for maintaining calibration of a thermocouple used in a bushing for the drawing of glass fiber. 4,167,403, Cl. 65-1.000.

Cohen, Robert E.: *See*—
Ramos, Alonso R.; and Cohen, Robert E., 4,167,544, Cl. 525-99.000.

Colgate-Palmolive Company: *See*—
Gray, Frederick W., 4,167,487, Cl. 252-102.000.

Collier, Robert J., to Bell Telephone Laboratories, Incorporated. Variable-spot scanning in an electron beam exposure system. 4,167,676, Cl. 250-492.00A.

Combustion Engineering, Inc.: *See*—
Mehta, Arun K.; Bozzuto, Carl R.; and Kantesaria, Prabhudas P., 4,167,578, Cl. 423-235.000.
Noyes, Richard C.; Zaman, Shakir U.; and Stuteville, Douglas W., 4,167,443, Cl. 176-36.00R.
Zielinski, Edward A.; and Comparato, Joseph R., 4,167,157, Cl. 122-4.00D.

Commissariat a l'Energie Atomique: *See*—
Aubert, Michel; and Lambert, Paul, 4,167,445, Cl. 176-65.000.

Commonwealth of Australia, care of the Department of Health, The: *See*—
Kossoff, George, 4,167,180, Cl. 128-660.000.

Communication Associates, Inc.: *See*—
Papson, John C., 4,167,709, Cl. 330-276.000.

Communication Manufacturing Co.: *See*—
O'Dea, Orrin B., 4,167,682, Cl. 307-237.000.

Comparato, Joseph R.: *See*—
Zielinski, Edward A.; and Comparato, Joseph R., 4,167,157, Cl. 122-4.00D.

Comsa, George: *See*—
Boden, Karl; Fremerey, Johan K.; Comsa, George; Gudden, Friedrich; Appelt, Gunther; Friedel, Rudolf; and Geldner, Ernst, 4,167,671, Cl. 250-406.000.

Conoco Methanation Company: *See*—
Winter, Richard G.; and Ramage, John H. A., 4,167,100, Cl. 62-82.000.

Conrad, Raymond W., to United States of America, Army. Nitrogen fixation with a high energy laser. 4,167,463, Cl. 204-157.10R.

Consiliul Popular al Judetului Braila: *See*—
Constantinescu, Victor, 4,167,356, Cl. 404-31.000.

Constantinescu, Spiridon. Car parking system. 4,167,365, Cl. 414-239.000.

Constantinescu, Victor, to Consiliul Popular al Judetului Braila. Roadway structures. 4,167,356, Cl. 404-31.000.

Conte, Jean C.: *See*—
Bolus, Daniel M. A. F.; Chevillon, Jean P.; Conte, Jean C.; and Philippe, Pierre D. P., 4,167,654, Cl. 179-81.00R.

Continental Group, Inc., The: *See*—
Gordon, Gerald A.; and Josephy, Karl, 4,167,234, Cl. 220-359.000.

Cook Electric Company: *See*—
Gilbert, Frederick W., 4,167,437, Cl. 159-28.00R.

Coon, Darryl D.: *See*—
Banavar, Jayanth R.; Coon, Darryl D.; and Derkits, Gustav E., Jr., 4,167,791, Cl. 365-175.000.

Cooper, Leslie E.; and Geitham, Glenn A., to Boeing Company, The. Automatic inspection apparatus. 4,167,066, Cl. 33-174.00P.

Cornetti, Giorgio: *See*—
Bassoli, Cesare; and Cornetti, Giorgio, 4,167,172, Cl. 123-196.00S.

Cornyn, William S.: *See*—
Schrader, Gustav E.; Scheucher, Karl; Cornyn, William S.; and Rea, Robert E., 4,167,462, Cl. 204-129.250.

Corwin, William C., to Beckman Instruments, Inc. Recorder pen servicing accessory. 4,167,743, Cl. 346-140.00R.

Courier de Mere, Henri E., to Bicosa Societe de Recherches. Flame or spark detection system and combustible gas ignition device. 4,167,767, Cl. 361-256.000.

Cousse, Henri: *See*—
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Delhon, Andre, 4,167,566, Cl. 42-249.000.

Cowherd, Frank G., III; and Theiling, Louis F., Jr., to Union Carbide Corporation. N,N-acryloxy ethoxy piperazines. 4,167,635, Cl. 544-388.000.

Creative Balloons, Inc.: *See*—
Zeyra, Avraham, 4,167,204, Cl. 141-348.000.

Cremers, Adrien E. J.; Maes, Andre P. A.; and Piegneur, Paul G. L., to Leuven Research & Development VZW. Process for the removal of metals from solution. 4,167,481, Cl. 210-36.000.

Creskoff, Jacob J. Parting agent for molds used in forming concrete and method of use. 4,167,549, Cl. 264-42.000.

Cribb, John A.: *See*—
Durance, Robert A.; and Cribb, John A., 4,167,656, Cl. 179-175.20R.

Cross, Michael A.; and Hurt, Fred S., to Westinghouse Electric Corp. Passive optical range simulator device. 4,167,328, Cl. 356-5.000.

Cupedo, Douwe J., to Cupedo's Octrooimaatschappij B.V. Butterfly valve. 4,167,263, Cl. 251-161.000.

Cupedo's Octrooimaatschappij B.V.: *See*—
Cupedo, Douwe J., 4,167,263, Cl. 251-161.000.

Cushman, George O., deceased: *See*—
Young, James E.; Cushman, George O., deceased; and Cushman, Ruth N., executrix, 4,167,333, Cl. 356-247.000.

Cushman, Ruth N., executrix: *See*—
Young, James E.; Cushman, George O., deceased; and Cushman, Ruth N., executrix, 4,167,333, Cl. 356-247.000.

Czarnecki, Lech; Lyczkowski, Mariusz; and Borowiak, Marek, to Politechnika Warszawaska. Method of production of compositions which exhibit no shrinkage or which increase in volume during setting. 4,167,611, Cl. 521-88.000.

Daikoku, Takashi: *See*—
Ueda, Shoji; Daikoku, Takashi; Takeda, Yorimasa; Hiromoto, Akira; Nagai, Nobuyuki; Moriguchi, Yasuo; and Ito, Yoshimasa, 4,167,427, Cl. 148-133.000.

Daimler-Benz Aktiengesellschaft: *See*—
Abthoff, Jorg; Schuster, Hans-Dieter; Huttebraucker, Dag-Harald; Kreeb, Reiner; and Laszlo, Marijan, 4,167,167, Cl. 123-139.0ST.

Danforth, Richard C. Compositions and process for colored liquid food or drink. 4,167,587, Cl. 426-250.000.

Danfoss A/S: *See*—
Nygaard, Nils H., 4,167,776, Cl. 363-56.000.
Sorensen, Frode; Pedersen, Hans K.; Jorgen, Hyldal; and Strandtoft, Benny, 4,167,691, Cl. 318-138.000.

D'Angelo, Robert S.; Hartman, Adrian R.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. High voltage monolithic transistor circuit. 4,167,748, Cl. 357-46.000.

Darrington, Franklin D.: *See*—
Akin, Cavit; and Darrington, Franklin D., 4,167,591, Cl. 426-656.000.

Dasibi Environmental Corporation: *See*—
Johns, Robert K.; Houston, Owen M.; and Frick, Gene, 4,167,665, Cl. 250-205.000.

Dataproducts Corporation: *See*—
Mower, Dan C.; Wolf, Peter H.; Slade, Boyd E.; and Albertalli, David, 4,167,342, Cl. 400-124.000.

Davis, Bernard H.; and Welsh, Thomas M., to H. H. Robertson Company. Sheet metal ribbon coating apparatus. 4,167,150, Cl. 118-33.000.

Davis, Brian C.; and Bryer, Robert P., to Sun Oil Company of Pennsylvania. PVC plasticized with monocyclohexylbiphenyl. 4,167,504, Cl. 260-33.6UA.

Davis, James S., to Union Carbide Corporation. Ethylene separation process. 4,167,402, Cl. 62-28.000.

Dayco Corporation: *See*—
Carey, Richard D., 4,167,645, Cl. 174-47.000.

DeArmitt, Duane W.: *See*—
Petro, Michael; Betz, Joseph R.; and DeArmitt, Duane W., 4,167,361, Cl. 405-290.000.

De Beukelaar, Jan W.: *See*—
Van Mannekes, Abraham; Channon, Ross T.; and De Beukelaar, Jan W., 4,167,619, Cl. 528-483.000.

Decker, David G., to Ampex Corporation. Bi-phase decoder apparatus and method. 4,167,760, Cl. 360-40.000.

Deere & Company: *See*—
Warman, Bruce L., 4,167,159, Cl. 123-41.080.

Defago, Raymond, to Ciba-Geigy AG. Transfer printing process for hydrophilic fibrous material or blends of hydrophilic and synthetic fibrous material, with reactive disperse dyes. 4,167,392, Cl. 8-2.50A.

Dehnert, Johannes; Hansen, Guenter; Kaack, Hermann; Kermer, Wolf-Dieter; Kurtz, Walter; and Schaffner, Ernst, to BASF Aktiengesellschaft. Uniformly dyed water-swellable cellulosic fibers. 4,167,394, Cl. 8-41.00R.

Delhon, Andre: *See*—
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Delhon, Andre, 4,167,566, Cl. 42-249.000.

Dell, M. Benjamin, to Aluminum Company of America. Mix suitable for use in seams between carbon blocks. 4,167,419, Cl. 106-284.000.

Den-Tal-Ez Mfg. Co.: *See*—
Page, Joe W., Jr.; and Stahlhuth, Paul H., 4,167,062, Cl. 32-26.000.

Denaro, Joseph M.: *See*—
Pick, Ernest W.; Denaro, Joseph M.; and Goerke, Henry R., 4,167,186, Cl. 128-232.000.

Dendy, Joe B., to Sperry Rand Corporation. Protective control system for magnetic suspension and magnetically suspended devices. 4,167,296, Cl. 308-10.000.

Denka Chemical Corporation: *See*—
Kerr, Ralph O., 4,167,516, Cl. 260-346.750.

de Nora, Vittorio; and Spaziante, Placido M., to Diamond Shamrock Technologies S.A. Halogen electrodes and storage batteries. 4,167,607, Cl. 429-15.000.

Den Otter, Marinus J.A.M.: *See*—
Schouteten, Augustinus P. H.; and Den Otter, Marinus J.A.M., 4,167,631, Cl. 544-192.000.

DeRezendes, Frank E., to Leaver, J. M. Concrete mold. 4,167,385, Cl. 425-410.000.

Derkits, Gustav E., Jr.: *See*—
Banavar, Jayanth R.; Coon, Darryl D.; and Derkits, Gustav E., Jr., 4,167,791, Cl. 365-175.000.

de Roo, Anthony M., to Dow Chemical Company, The. Method for binding a water-soluble direct dye to paper. 4,167,393, Cl. 8-7.000.

De Vivo, Mario. Refuse container transport. 4,167,366, Cl. 414-697.000.

DeVries, Robert C.: *See*—
Lee, Minyoung; Szala, Laurence E.; and DeVries, Robert C., 4,167,399, Cl. 51-307.000.

DeWitt, Paolo; and Ramacci, Maria T., to SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A. N-6-Chloronicotinoyl-d,l-homocysteine thiolactone. 4,167,572, Cl. 424-266.000.

Dexter, Martin: *See*—
Zussman, Hyman W.; Knell, Martin; and Dexter, Martin, 4,167,465, Cl. 204-159.150.

Diamond Shamrock Technologies S.A.: *See—*
de Nora, Vittorio; and Spaziante, Placido M., 4,167,607, Cl. 429-15.000.

Dick, James E.; Sherk, Fred T.; and Drehman, Lewis E., to Phillips Petroleum Co. Hydrocarbon treating process. 4,167,472, Cl. 208-80.000.

Dick, Perry J., Jr., to Trumbull Corporation. Process and apparatus for applying and compacting castable material in strips on a sloped surface. 4,167,360, Cl. 405-271.000.

Dickie, William R.: *See—*
Bell, Lon E.; Hamilton, Brian K.; Dickie, William R.; Wulbrecht, Robert M.; and Radke, Donald G., 4,167,276, Cl. 280-731.000.

Dickson, C. R.; and Nozik, A. J., to Allied Chemical Corporation. Photoenhanced reduction process. 4,167,461, Cl. 204-102.000.

Dietrich, Otto E. Multiple tool driving turret attachment. 4,167,362, Cl. 408-35.000.

Digital Equipment Corporation: *See—*
Sullivan, Daniel T.; Kaman, Charles H.; O'Loughlin, James F.; and Kapadia, Jamshed R., 4,167,779, Cl. 364-200.000.

DiLorenzo, Beth A.: *See—*
Lamberti, Vincent; Konort, Mark D.; and DiLorenzo, Beth A., 4,167,561, Cl. 424-149.000.

DiNatale, Robert F. Photographic printing method. 4,167,327, Cl. 355-77.000.

Dodwell, Geoffrey M., to Ciba-Geigy AG. Method of subbing a polyester base. 4,167,593, Cl. 427-171.000.

Dolby, Gareth B.: *See—*
Bodle, Ronald L.; and Dolby, Gareth B., 4,167,706, Cl. 328-26.000.

Dominion Engineering Works Limited: *See—*
Harris, Thomas E., 4,167,105, Cl. 72-19.000.

Donnelly, Donald E.; Breig, John W.; and Gellner, Robert L., to Emerson Electric Co. Oil burner primary control for interrupted ignition system. 4,167,389, Cl. 431-79.000.

Doshi, Niranjan K., to Apostol, Frank. Power-converting device. 4,167,375, Cl. 418-54.000.

Dow Chemical Company, The: *See—*
de Roo, Anthony M., 4,167,393, Cl. 8-7.000.
Gessell, Donald E.; and Lowery, Kirby, Jr., 4,167,615, Cl. 526-161.000.
Juckniess, Paul R.; and Johnson, David R., 4,167,468, Cl. 204-247.000.
Nelson, Donald L., 4,167,542, Cl. 525-445.000.

Dow Corning Corporation: *See—*
Klosowski, Jerome M.; and Romig, Charles A., 4,167,511, Cl. 260-239.30R.
Rooks, Robert J., 4,167,501, Cl. 260-29.40R.

Downing, James H.; and Merkert, Rodney F., to Union Carbide Corporation. Process for lowering the sulfur content of vanadium-carbon materials used as additions to steel. 4,167,409, Cl. 75-129.000.

Doyel, John S. Vibratory action cleaning device. 4,167,341, Cl. 366-114.000.

Drachev, Viktor P.: *See—*
Timofeev, Alexandr V.; Batjukov, Vladimir I.; Fadeev, Alexandr I.; Shapkin, Alexandr F.; Shkhiyan, Tsolak G.; Ordynsky, Georgy V.; Drachev, Viktor P.; and Pogodin, Evgeny N., 4,167,442, Cl. 176-30.000.

Drackett Company, The: *See—*
Murtaugh, Justin J., 4,167,488, Cl. 252-160.000.

Drehman, Lewis E.: *See—*
Dick, James E.; Sherk, Fred T.; and Drehman, Lewis E., 4,167,472, Cl. 208-80.000.

Dresser Industries, Inc.: *See—*
McQueen, Robert W., 4,167,219, Cl. 175-229.000.
O'Dell, Larry A., 4,167,293, Cl. 299-82.000.

Driscoll, Richard C.: *See—*
Gargiulo, Robert J.; and Driscoll, Richard C., 4,167,449, Cl. 435-16.000.

DSO "RODOPA": *See—*
Zvetkov, Atanas Z.; and Zvetkov, Stanislav Z., 4,167,124, Cl. 74-230.190.

Dueck, Richard: *See—*
Persha, Thomas J.; Lehto, Eino M.; Dueck, Richard; and Hechimovich, Nick, 4,167,310, Cl. 353-52.000.

Duncan, James H., to Chloride Silent Power Limited. Methods of manufacture of beta-alumina. 4,167,550, Cl. 264-66.000.

Dunkelberger, David L., to Rohm and Haas Company. Impact modified high melt flow polycarbonamide. 4,167,505, Cl. 260-37.00N.

Du Pont de Nemours, E. I., and Company: *See—*
Hazan, Isidor, 4,167,499, Cl. 260-21.000.
Looney, Catharine E., 4,167,490, Cl. 252-300.000.
Morgan, James G., 4,167,414, Cl. 96-87.00R.
Nielsen, Norman A., 4,167,527, Cl. 260-603.00C.

Durance, Robert A.; and Cribb, John A., to Mitel Corporation. Junctor checking system. 4,167,656, Cl. 179-175.20R.

Dynapol: *See—*
Bellanca, Nicolo; and Furia, Thomas E., 4,167,422, Cl. 106-289.000.

Dynasty Design, Inc.: *See—*
Tang, Darl L., 4,167,073, Cl. 40-124.100.

Eastman Kodak Company: *See—*
Hage, Charles T., 4,167,323, Cl. 355-3.00R.
Hutchinson, William J., 4,167,320, Cl. 354-323.000.
Regan, Michael T.; Reynolds, George A.; Specht, Donald P.; and Van Allan, James A., 4,167,412, Cl. 96-1.600.

Edmonson, Orvan D.; and Wood, William D., to Toro Company, The. Power equipment starting system. 4,167,221, Cl. 180-19.00H.

Efka-Werke Fritz Kiehn GmbH: *See—*
Ruppert, Heinrich W.; Gatschmann, Klaus; and Haller, Hans, 4,167,091, Cl. 53-149.000.

Eggermont, Ludwig D. J., to U.S. Philips Corporation. Integrating code converter. 4,167,731, Cl. 340-347.0DD.

Eichelberger, Charles W.: *See—*
Miller, Edward B.; and Eichelberger, Charles W., 4,167,786, Cl. 364-493.000.

Eifert, Robin: *See—*
Chesbro, William R.; Eifert, Robin; and Evans, Thomas, 4,167,450, Cl. 435-3.000.

Eisenberg, Arnold J.: *See—*
Klink, Jerome P.; and Eisenberg, Arnold J., 4,167,252, Cl. 242-18.00G.

Ekco Products, Inc.: *See—*
Hare, Wilbert K., 4,167,233, Cl. 220-72.000.

Elbe, Maximo, to Magnusson, Gerda. Mounting assembly for gem blanks. 4,167,085, Cl. 51-229.000.

El Bindari, Ahmed, to Guardex Corporation. Passive anti-theft device. 4,167,222, Cl. 180-287.000.

Electricity Council, The: *See—*
Simpson, David P., 4,167,209, Cl. 165-1.000.

Elek, Sandor: *See—*
Bognar, Rezso; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,167,636, Cl. 546-46.000.

Elektroflo Systems Limited: *See—*
Tomlinson, Hugh F. D., 4,167,736, Cl. 343-5.0NA.

Ellenberger & Poensgen GmbH: *See—*
Krasser, Fritz, 4,167,720, Cl. 337-60.000.

Eller, Saul A. Method of using a low temperature freezing softening and abrasion fluid. 4,167,292, Cl. 299-7.000.

Elliott, Laurence E.: *See—*
Habas, Walter F.; and Elliott, Laurence E., 4,167,131, Cl. 83-304.000.

ELMEG-Elektro-Mechanik Gesellschaft mit beschrankter Haftung: *See—*
Zielke, Alfred, 4,167,657, Cl. 200-5.0EA.

Emerson Electric Co.: *See—*
Donnelly, Donald E.; Breig, John W.; and Gellner, Robert L., 4,167,389, Cl. 431-79.000.

Emhart Industries, Inc.: *See—*
Willitts, Benjamin R., 4,167,102, Cl. 62-152.000.

Engelhardt, Friedrich; Hintermeier, Karl; Ribka, Joachim; and Beutler, Helmut, to Cassella Aktiengesellschaft. Water-soluble branched polyesters. 4,167,395, Cl. 8-173.000.

Engelhardt, Gunther: *See—*
Schmidt, Gunther; Puschmann, Sigfrid; and Engelhardt, Gunther, 4,167,570, Cl. 424-256.000.

Englund, Costa R.; and Wincent, Karl T., to Svenska Kassaregister AB. Printing apparatus with selectively movable printing heads. 4,167,345, Cl. 400-588.000.

Environmental Research Institute of Michigan: *See—*
Christenson, Dempster S.; Gordon, Michael F.; Kistler, Roland D.; Kriegler, Frank J.; Lampert, Seymour R.; Marshall, Robert E.; McLaughlin, Rowland H.; and Smith, Vernon H., 4,167,729, Cl. 340-146.3AH.
Sternberg, Stanley R., 4,167,728, Cl. 340-146.3MA.

Envirotech Corporation: *See—*
Onushco, Andrew J., 4,167,400, Cl. 55-146.000.

Eppinger, Kurt H.: *See—*
Bolto, Brian A.; and Eppinger, Kurt H., 4,167,610, Cl. 521-31.000.

ERCO Industries Limited: *See—*
Charnock, John A., 4,167,643, Cl. 13-18.00C.

Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, to SKF Kugellagerfabriken GmbH. System for lubricating the bearings of cutting rollers of a roller bit. 4,167,220, Cl. 175-337.000.

Ero Industries, Inc.: *See—*
Galecke, Robert A., 4,167,051, Cl. 9-329.000.

Eskeli, Michael. Method of fluid pressurization. 4,167,371, Cl. 417-53.000.

ESPE Fabrik Pharmazeutischer Praparate GmbH: *See—*
Schmitt, Werner; Purrman, Robert; Jochum, Peter; and Zahler, Wolf-Dieter, 4,167,618, Cl. 528-424.000.

Essilor International: *See—*
Guiset, Michel, 4,167,067, Cl. 33-200.000.

Esterowitz, Leon; Bartoli, Filbert J.; Allen, Roger E.; Goldberg, Lawrence S.; Nicolai, Van O.; Kruer, Melvin R.; Linz, Arthur; and Jenssen, Hans P., to United States of America, Navy. Praseodymium blue-green laser system. 4,167,712, Cl. 331-94.50F.

Ethyl Corporation: *See—*
Sistrunk, Thomas O., 4,167,603, Cl. 428-260.000.

Evans, Thomas: *See—*
Chesbro, William R.; Eifert, Robin; and Evans, Thomas, 4,167,450, Cl. 435-3.000.

Evers, H. Ray. Method and composition for treating arteriosclerosis. 4,167,562, Cl. 424-153.000.

Ex-Cell-O Corporation: *See—*
Chau, Set B., 4,167,766, Cl. 360-104.000.

Exxon Nuclear Company, Inc.: *See—*
Stark, Thomas M., 4,167,244, Cl. 233-18.000.

Exxon Production Research Company: *See—*
Stokley, Charles O.; Muecke, Thomas W.; Gruesbeck, Clay, Jr.; and Salathiel, William M., 4,167,117, Cl. 73-422.00R.

Exxon Research & Engineering Co.: *See*—
Baker, Richard H.; and White, Kevin E., 4,167,775, Cl. 363-42.000.
Brois, Stanley J.; and Gutierrez, Antonio, 4,167,514, Cl. 260-343.500.
Kurth, William T.; and Miles, Steven G., 4,167,644, Cl. 136-89.0EP.

Ezekiel, Frederick D. Magnetic liquid protector. 4,167,726, Cl. 338-231.000.

Factor, Arnold, to General Electric Company. Organopolysiloxane-phenolphthalein-polycarbonate copolymers. 4,167,536, Cl. 525-450.000.

Fadeev, Alexandr I.: *See*—
Timofeev, Alexandr V.; Batjukov, Vladimir I.; Fadeev, Alexandr I.; Shapkin, Alexandr F.; Shkhiyan, Tsolak G.; Ordynsky, Georgy V.; Drachev, Viktor P.; and Pogodin, Evgeny N., 4,167,442, Cl. 176-30.000.

Fahrbach, Gerhard; Gerberding, Karl; Seiler, Erhard; and Stein, Dieter, to BASF Aktiengesellschaft. Branched block copolymers and their manufacture. 4,167,545, Cl. 525-122.000.

Fairchild Camera and Instrument Corporation: *See*—
Beccia, Anthony R.; Boehlje, Robert D.; Jacobsen, Peter T.; and Olney, Richard, 4,167,781, Cl. 364-200.000.

Falaschi, Karl D.: *See*—
High, Cliff R.; and Falaschi, Karl D., 4,167,344, Cl. 400-130.000.

Falk, Carl H., to Aktiebolaget Karlstads Mekaniska Werkstad. Spray cleaning apparatus. 4,167,440, Cl. 162-277.000.

Falke, Wilbert L.: *See*—
Lee, Agnes Y.; Falke, Wilbert L.; and Schwaneke, Alfred E., 4,167,459, Cl. 204-44.000.

Farge, Daniel: *See*—
Bourzat, Jean D.; Farge, Daniel; Leger, Andre; and Ponsinet, Gerard, 4,167,571, Cl. 424-263.000.

Farha, Floyd, Jr.: *See*—
Walker, Darrel W.; Hogan, Robert J.; and Farha, Floyd, Jr., 4,167,532, Cl. 585-622.000.

Farthing, Alan C.; and Nicholson, Eric S., to Imperial Chemical Industries Limited. Process for preparing N,N,N',N'-tetraphenyldiaminomethane. 4,167,526, Cl. 260-570.50P.

Faustini, Carlo, to Aiken Fund, Inc., The. Asynchronous circuit and system. 4,167,789, Cl. 364-900.000.

Fayren, Jose M. Floating apparatus and method of assembling the same. 4,167,148, Cl. 114-265.000.

Feitzinger, Eduard; and Mastroianni, Emilio G., to GAF Corporation. Device for ammonia fume reduction. 4,167,319, Cl. 354-300.000.

Feldman, Michael A. Apparatus for applying a soft contact lens. 4,167,283, Cl. 294-1.0CA.

Feldstein, Nathan. Method of preparation and use of electroless plating catalysts. 4,167,596, Cl. 427-306.000.

Fenner, Hans; Auwarter, Wilhelm; and Stark, Karl-Heinz, to Ramseier & Jenzer AG, Carosseriewerke Bern. Sidewall structure of a bus with seats mounted on the wall. 4,167,285, Cl. 296-178.000.

Ferdon, Gilbert D.: *See*—
Bowen, Terry P.; Hoover, Charles D.; Ferdon, Gilbert D.; and Harwood, Robert G., 4,167,303, Cl. 350-96.210.

Feres, Vaclav. Evaporator. 4,167,454, Cl. 202-236.000.

Ferguson, Bruce A.: *See*—
Ptasinski, Leo D.; and Ferguson, Bruce A., 4,167,053, Cl. 24-113.00R.

Fiat Societa per Azioni: *See*—
Bassoli, Cesare; and Cornetti, Giorgio, 4,167,172, Cl. 123-196.00S.

Fiber Industries, Inc.: *See*—
Alexander, William, 4,167,541, Cl. 525-444.000.

Filonov, Oleg V.: *See*—
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.

Finlay, Ian C.; and Gallacher, George R., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Fuel vaporizers for internal combustion engines. 4,167,165, Cl. 123-122.0AA.

Firestone, Raymond A., to Merck & Co., Inc. Process for epimerizing beta-lactam antibiotic compounds, and related products. 4,167,630, Cl. 544-90.000.

Firestone Tire & Rubber Company, The: *See*—
Rumpf, Robert J., 4,167,277, Cl. 280-807.000.

Fischer & Porter Company: *See*—
Siegel, William A., 4,167,122, Cl. 73-706.000.
Stoever, Juergen, 4,167,115, Cl. 73-194.00E.

Fischer, Walter W.; Jucker, Peter; and Ingold, Werner, to Proton AG. Measuring electrode, especially glass electrode. 4,167,300, Cl. 339-94.00C.

Fishbaugh, Warren D.: *See*—
Freedman, Frank J.; and Fishbaugh, Warren D., 4,167,382, Cl. 425-256.000.

Fisher, Colin, to Metals Research Limited. Crystallization apparatus having floating die member with tapered aperture. 4,167,554, Cl. 422-246.000.

FKF Berlin Fleischwaren- und Konservenfabrik Schulz & Berndt GmbH & Co.: *See*—
Olschewski, Hans J., 4,167,435, Cl. 156-583.100.

Fleck, Fritz; Mercer, Alec V.; and Paver, Roger, to Sandoz Ltd. Triazolyl stilbene triazoles. 4,167,626, Cl. 542-435.000.

Fleck, Fritz; and Schmid, Horst, to Sandoz Ltd. Triazolylstyrene compounds. 4,167,629, Cl. 542-456.000.

Flora, Laurence P., to Burroughs Corporation. Constant impedance transmission line routing network. 4,167,714, Cl. 333-101.000.

FMC Corporation: *See*—
Thorne, Paul M., 4,167,215, Cl. 166-341.000.

Fogel, Isaac, to Classic Products Corporation. Waterbed frame cover. 4,167,049, Cl. 5-402.000.

Ford Industries, Inc.: *See*—
Clarridge, Glenn E., 4,167,257, Cl. 242-201.000.

Ford Motor Company: *See*—
Akman, Ahmet R., 4,167,162, Cl. 123-117.00A.
Rao, Vemulapalli D. N.; and Jaimee, Angelo, 4,167,207, Cl. 164-9.000.

Ford, Roger E.: *See*—
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Forge, Charles O., to Boschert Associates. Variable ratio transformer. 4,167,719, Cl. 336-77.000.

Forster, Bernhard: *See*—
Forster, Rolf, 4,167,061, Cl. 32-14.00D.

Forster, Rolf, to Forster, Bernhard. Orthodontic appliance. 4,167,061, Cl. 32-14.00D.

Fortunko, Christopher M.: *See*—
Shaw, Herbert J.; Souquet, Jacques; and Fortunko, Christopher M., 4,167,120, Cl. 73-505.000.

Fosdick, Dale P.: *See*—
Rosaen, Borje O.; and Fosdick, Dale P., 4,167,483, Cl. 210-130.000.

Fowler, Frank C.; and Smith, Don H., to Atlas Powder Company. Recovery of nitrated compounds using solvent extraction and distillation. 4,167,521, Cl. 260-467.000.

Fracalossi, Roland N.: *See*—
Tucker, Richard B. C.; Fracalossi, Roland N.; and Wajer, Mark T., 4,167,612, Cl. 521-110.000.

Fragoso, Raymond. Brake assembly for wheeled personal vehicle. 4,167,225, Cl. 188-5.000.

Frank, Bernard A.: *See*—
Pugh, Robert W.; and Frank, Bernard A., 4,167,075, Cl. 40-617.000.

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Donnelly, Donald E.; Breig, John W.; and Gellner, Robert L., 4,167,389, Cl. 431-79.000.

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Arachi, John M., 4,167,430, Cl. 156-212.000.

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Brown, Harry H., 4,167,730, Cl. 340-163.000.
Factor, Arnold, 4,167,536, Cl. 525-450.000.
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Hanson, James M., 4,167,773, Cl. 362-13.000.
Ingold, Raymond W., 4,167,670, Cl. 250-402.000.
Lee, Minyoung; Szala, Laurence E.; and DeVries, Robert C., 4,167,399, Cl. 51-307.000.
Lynk, Edgar T., 4,167,753, Cl. 358-140.000.
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Girard, Leon E., to Iowa State University Research Foundation, Inc. Means for actuating artificial or disabled arm members. 4,167,044, Cl. 3-1.000.

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Anderson, Jack L.; Swiatowiecz, Frank J.; and Glazer, Marvin A., 4,167,727, Cl. 340-146.1AG.

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Esterowitz, Leon; Bartoli, Filbert J.; Allen, Roger E.; Goldberg, Lawrence S.; Nicolai, Van O.; Kruer, Melvin R.; Linz, Arthur; and Jenssen, Hans P., 4,167,712, Cl. 331-94.50F.

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Graybill, Howard W., 4,167,770, Cl. 361-378.000.
Horn, John, 4,167,716, Cl. 335-14.000.
Knapp, Edward J., Jr., 4,167,722, Cl. 337-252.000.
Luke, Roger D.; and Rhodes, John M., 4,167,769, Cl. 361-355.000.
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Paitula, Hannu O.; and Larsson, Roland A., 4,167,254, Cl. 242-107.40A.

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Whittenberger, John S., 4,167,265, Cl. 270-68.00A.

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Gray, Frederick W., to Colgate-Palmolive Company. Aromatic activator. 4,167,487, Cl. 252-102.000.
Graybill, Howard W., to Gould Inc. Isolating gas barrier between bus and accessory equipment. 4,167,770, Cl. 361-378.000.
Green, James R., to Altainer, Inc. Loose fill dispensing and storage system. 4,167,235, Cl. 222-105.000.
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Gross, Ronald D., to Chloride Electro Networks. Emergency standby system for automatic transfer from utility power to a battery powered system. 4,167,680, Cl. 307-66.000.
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Grundei, Hans; Henssage, Joachim; Thomas, Wolfram; and Schutt, Gerhard. Shanks for knee-joint endoprostheses. 4,167,047, Cl. 3-1.911.
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Lakshmanan, Pallavoor R., 4,167,433, Cl. 156-322.000.
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Davis, Bernard H.; and Welsh, Thomas M., 4,167,150, Cl. 118-33.000.
H. Kuhnke Elektrotechnik GmbH: *See*—
Hodler, Karl, 4,167,199, Cl. 137-624.110.
Haaf, William R., to General Electric Company. Composition of a polyphenylene ether and a hydrogenated block copolymer. 4,167,507, Cl. 525-92.000.
Habas, Walter F.; and Elliott, Laurence E., to Union Camp Corporation. Skip perforator. 4,167,131, Cl. 83-304.000.
Hage, Charles T., to Eastman Kodak Company. Reproduction apparatus for producing simplex or duplex copies. 4,167,323, Cl. 355-3.00R.
Hager, Nathaniel E., Jr., to Armstrong Cork Company. Method of determining heat losses through electrical outlets. 4,167,116, Cl. 73-228.000.
Hagg, Per B.; Bergstrom, Sven I.; Lundmark, Lars E.; and Hedberg, Carl-Erik L., to Mo och Domsjo AB. Apparatus for shredding and dry-defibrating compressed cellulose pulp and forming a batt of the resulting cellulosic fibrous material. 4,167,378, Cl. 425-82.100.
Hahin, Christopher. Bracket means for mounting test fixtures on boiler tubes. 4,167,260, Cl. 248-225.30A.
Hall, Don R.: *See*—
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Haller, Hans: *See*—
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Hanson, James M., to General Electric Company. Photoflash lamp array having contoured sheet shield. 4,167,773, Cl. 362-13.000.
Hansson, Erik G., to Svenska Kram AB. Attachment device and assembly. 4,167,355, Cl. 403-374.000.
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Price, Thomas L., 4,167,202, Cl. 140-115.000.
Harris, Robert L., to A. T. Cross Company. Writing instrument. 4,167,350, Cl. 401-260.000.
Harris, Thomas E., to Dominion Engineering Works Limited. Tandem mill drive control system. 4,167,105, Cl. 72-19.000.
Hartig, Guenter, to Optac Wilfrid Weltin. Apparatus for securing a hearing protector to a protective helmet. 4,167,043, Cl. 2-423.000.
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Hatchett, Michael R.; and Rigbey, Leonard J., to International Business Machines Corporation. Flexible record disk signal storage apparatus. 4,167,269, Cl. 274-39.00A.
Haus, Jan F., to J. G. Spin-L, Inc. Apparatus for spraying refractory lining. 4,167,246, Cl. 239-227.000.
Hauschild, Ulrich; Kaspers, Hans-Heinz; and Rotger, Heinrich, to Kali-Chemie Aktiengesellschaft. High temperature decomposition process for producing an alkali-containing calcined phosphate fertilizer. 4,167,406, Cl. 71-45.000.
Haville, George D., to BEI Electronics, Inc. Velocity measuring system. 4,167,330, Cl. 356-28.000.
Hawk, Gary D., to Harding Development Company. Paint roller support tray. 4,167,348, Cl. 401-121.000.
Hayashi, Hiromu, to Fujitsu Limited. Data processing unit having scan-in and scan-out means. 4,167,780, Cl. 364-200.000.
Hayashi, Tadahiko, to Asahi Glass Company, Ltd. Thermosettable resin molding compound. 4,167,552, Cl. 264-328.000.
Hayashi, Torahiko. Pressure feeder including pusher assemblies. 4,167,237, Cl. 222-265.000.
Hayashibara Biochemical Laboratories, Inc.: *See*—
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Hayes, John C., to UOP Inc. Acidic multimetallic catalytic composite. 4,167,495, Cl. 252-441.000.
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Haywood, Glen H. Percussive tool with replaceable work bit. 4,167,141, Cl. 104-10.000.
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Heard, Roderick S.; and Phillips, David W., to International Business Machines Corporation. Raster slant control in an ink jet printer. 4,167,741, Cl. 346-75.000.
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Caridis, Andrew A.; and Benson, Clark K., 4,167,585, Cl. 426-233.000.
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Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., to Gulf Oil Corporation. Styrene-grafted polyanhydride copolymer. 4,167,539, Cl. 525-117.000.
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Herbst, Heiner, to Siemens Aktiengesellschaft. Method for producing lateral bipolar transistor by ion-implantation and controlled temperature treatment. 4,167,425, Cl. 148-1.500.
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Kohnke, Ole B., 4,167,184, Cl. 128-145.700.
Hesse, Wolfgang: *See*—
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Hestad, Alfred M.; and Synek, Jan, to United Networks Inc. Push button to rotary dial converter systems. 4,167,655, Cl. 179-90.00K.
Hewlett-Packard Company: *See*—
Nielsen, Larry L., 4,167,331, Cl. 356-39.000.
High, Cliff R.; and Falaschi, Karl D., to Morley Studios. Electronically controlled token engraving apparatus. 4,167,344, Cl. 400-130.000.
Higuchi, Tetsuo; and Nakayama, Hiroyuki, to Kansai Paint Co., Ltd. Photocurable composition comprising copolymer of maleic acid monoester and α-olefin compound. 4,167,415, Cl. 96-115.00R.
Hihara, Yukiyosi, to Yasui Sangyo Co., Ltd. Wheel fixing device. 4,167,118, Cl. 73-487.000.
Hill, Forest L. Animal feeder. 4,167,154, Cl. 119-53.000.
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Calvert, Ronald J., 4,167,127, Cl. 74-416.000.
Hilmoe, Lawrence J. Centrifugal casting equipment having an interchangeable. 4,167,381, Cl. 425-182.000.
Himmele, Walter; Koenig, Karl-Heinz; Goetz, Norbert; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Method of controlling fungi with 3,5-dimethyl-piperidin-4-ones. 4,167,573, Cl. 424-267.000.
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Jarman, Davis R.; and Hinson, Virgil H., 4,167,108, Cl. 72-477.000.
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Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, 4,167,718, Cl. 335-284.000.
Hixon, William K. Control system for vehicle overdrive transmission. 4,167,126, Cl. 74-336.00R.
Hoch, Helmut; Hiller, Heinrich; and Bauni, Guenther, to BASF Aktiengesellschaft. Manufacture of a pigmentary form of α-indanthrone. 4,167,634, Cl. 544-339.000.
Hochtemperatur-Kernkraftwerk GmbH KG Gemeinsames Europaisches Unternehmen: *See*—
Schweiger, Fritz, 4,167,444, Cl. 176-37.000.
Hock, Ong S.; and Cheng, Chuah C., to University of Science of Malaysia. Olein-stearin separation. 4,167,519, Cl. 260-428.500.
Hodler, Karl, to H. Kuhnke Elektrotechnik GmbH. Timing device for pneumatic signals. 4,167,199, Cl. 137-624.110.
Hoechst Aktiengesellschaft: *See*—
Billenstein, Seigfried; Brecht, Heinz; and Hoffmann, Dieter, 4,167,639, Cl. 560-151.000.
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Holland-Letz, Guenter, to Nixdorf Computer AG. Apparatus for the timed transporting of forms. 4,167,346, Cl. 400-618.000.
Holmes, Terry M., to J. I. Case Company. Main frame construction for vehicles. 4,167,278, Cl. 280-786.000.
Holtey, Thomas O.: *See*—
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Holz, Emil, to Hermann Finckh Maschinenfabrik. Method and apparatus for preparing and cleaning fibrous material. 4,167,438, Cl. 162-4.000.
Holzer, Karl, to Laevosan-Gesellschaft mbH & Co KG. Process for preparing hydroxyethyl starch suitable as a plasma expander. 4,167,622, Cl. 536-111.000.
Honeywell Inc.: *See*—
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Horn, John, to Gould Inc. Controlled switching apparatus. 4,167,716, Cl. 335-14.000.
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Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,167,543, Cl. 525-74.000.
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Ichiba, Terumichi; Kawaguchi, Munetaka; and Yamamoto, Yutaka, to Sumitomo Electric Industries Ltd. Optical transmission fiber. 4,167,305, Cl. 350-96.340.
Ichiyanagi, Toshikazu; and Iwashita, Tomonori, to Canon Kabushiki Kaisha. Motor drive unit for a camera. 4,167,314, Cl. 354-173.000.
ICI Australia Limited: *See*—
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Idenawa, Hiroyuki: *See*—
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Farthing, Alan C.; and Nicholson, Eric S., 4,167,526, Cl. 260-570.50P.
Mills, Stuart D., 4,167,569, Cl. 424-251.000.
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Smith, Leslie H., 4,167,581, Cl. 424-304.000.
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Instrumentation Specialties Company: *See*—
Allington, Robert W., 4,167,777, Cl. 363-61.000.
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Barclay, Donald J.; Bird, Colin L.; and Lowe, Anthony C., 4,167,308, Cl. 350-357.000.
Barclay, Donald J.; Bird, Colin L.; Lowe, Anthony C.; and Martin, David H., 4,167,309, Cl. 350-357.000.
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International Flavors & Fragrances Inc.: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,167,497, Cl. 252-522.000.
International Harvester Company: *See*—
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International Nickel Company, Inc., The: *See*—
Oakley, Samuel T., 4,167,377, Cl. 425-79.000.
International Shoe Machine Corporation: *See*—
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Bolus, Daniel M. A. F.; Chevillon, Jean P.; Conte, Jean C.; and Philippe, Pierre D. P., 4,167,654, Cl. 179-81.00R.
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Ishibashi, Masayuki; and Morita, Tuneo, to Tokyo Shibaura Electric Co., Ltd. MIS-type field effect transistor and method of producing the same. 4,167,745, Cl. 357-23.000.
Ishihara, Takeshi, to Kabushiki Kaisha Komatsu Seisakusho. Impeller blading of a centrifugal compressor. 4,167,369, Cl. 416-185.000.
Isono, Hiromasa: *See*—
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Issler, Jorg; Funke, Helmut; and Schmidt, Klaus, to Robert Bosch GmbH. Positively lubricated distributor construction for internal combustion engines. 4,167,171, Cl. 123-196.00R.
Iten, Clemens A. Disposable razor. 4,167,059, Cl. 30-32.000.
Ito, Fumio: *See*—
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Ito, Tadashi: *See*—
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Iwami, Tadakatsu. Rotary internal combustion engine. 4,167,173, Cl. 123-219.000.
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Holmes, Terry M., 4,167,278, Cl. 280-786.000.
Jackson, Dale H., to Harris Corporation. Bulk article sorting system. 4,167,476, Cl. 209-3.300.
Jackson, Joseph F., to Thomas Broadbent & Sons Limited. Scroll discharge decanter centrifuges. 4,167,243, Cl. 233-7.000.
Jacobsen, Peter T.: *See*—
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Jaerisch, Walter; Makosch, Guenter; and Schmackpfeffer, Arno, to International Business Machines Corporation. Interferometric apparatus and process. 4,167,337, Cl. 356-354.000.
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Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, to Vyzkumny ustav lykovych vlaken Sumperk; and Strojni a traktorova stanice v Zatci, narodni podnik Zatec Corporation. Program unit for accurate actuation and control of individual operations. 4,167,123, Cl. 74-125.500.
James River Graphics Inc.: *See*—
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James, Robert G. Horizontal pumping unit. 4,167,098, Cl. 60-369.000.
Janssen, Harvey W., to Wolff Manufacturing Company. Conveyor and shoe lifting assembly for tractor tracks. 4,167,058, Cl. 29-822.000.
Janssen Pharmaceutica, N.V.: *See*—
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Janssens, Frans, to Janssen Pharmaceutica, N.V. N-phenyl-N-(4-piperidinyl)amides. 4,167,574, Cl. 424-267.000.
Japan Steel Works, Ltd., The: *See*—
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Jarman, Davis R.; and Hinson, Virgil H. Adjustable hole-engaging hook device. 4,167,108, Cl. 72-477.000.
Jarrett, Boaz A.; and Lakra, Paul, to C.A.V. Limited. Fuel injection pumping apparatus. 4,167,373, Cl. 417-289.000.
Jassawalla, Jal S.: *See*—
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Jazenski, Peter J.; and Sadowski, John S., to Lord Corporation. Aqueous compositions comprising phenolic resin and crosslinking agent. 4,167,500, Cl. 260-29.300.
Jelalian, Albert V.; Sonnenschein, Charles M.; and Keene, Wayne H., to Raytheon Company. Focussed doppler radar. 4,167,329, Cl. 356-5.000.
Jensen, Ned L., to Albion Laboratories, Inc. Biological assimilation of metals. 4,167,564, Cl. 424-177.000.
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Jenssen, Hans P.: *See*—
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Jet Accessories, Inc.: *See—*
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Jochum, Peter: *See—*
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Johansson, John R., to Gravmaskinsbolaget John Johansson AB. Boom arrangement for dragline. 4,167,072, Cl. 37-116.000.

Johns-Manville Corporation: *See—*
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Johns, Robert K.; Houston, Owen M.; and Frick, Gene, to Daaibi Environmental Corporation. Automatic calibration circuit for gas analyzers. 4,167,665, Cl. 250-205.000.

Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Sonar controlled lens focus apparatus. 4,167,316, Cl. 354-197.000.

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Johnson, Paul E. Combination stove and fireplace. 4,167,176, Cl. 126-120.000.

Johnson, Roy A.; and Sih, John C., to Upjohn Company, The. 5-Hydroxy-PGI$_1$ pyrrolinylamides. 4,167,624, Cl. 542-426.000.

Jorgen, Hyldal: *See—*
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Juckniess, Paul R.; and Johnson, David R., to Dow Chemical Company, The. Apparatus for electrowinning multivalent metals. 4,167,468, Cl. 204-247.000.

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Kadija, Igor V.; and Woodard, Kenneth E., Jr., to Olin Corporation. Diaphragms for use in the electrolysis of alkali metal chlorides. 4,167,469, Cl. 204-296.000.

Kaiser, Klaus: *See—*
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Kali-Chemie Aktiengesellschaft: *See—*
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Kaman, Charles H.: *See—*
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Karnofsky, George B. Process and apparatus for solvent extraction of oil from oil-containing diatomite ore. 4,167,470, Cl. 208-8.0LE.

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Keller, Martin B., to Sandy Hill Corporation. Papermaking machine. 4,167,441, Cl. 162-290.000.

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Kerr, Ralph O., to Denka Chemical Corporation. Preparation of dicarboxylic anhydrides. 4,167,516, Cl. 260-346.750.

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Klosowski, Jerome M.; and Romig, Charles A., to Dow Corning Corporation. Methylsilacyclopentenyl-containing silylating agents and method therefor. 4,167,511, Cl. 260-239.30R.

Knapp, Edward J., Jr., to Gould Inc. Electric fuse construction. 4,167,722, Cl. 337-252.000.

Knappstein, Johannes; Thiersch, Friedrich; Schuch, Werner; Weber, Rolf; Beck, Kurt-Gunther; and Stahlherm, Dieter, to Carl Still, Recklinghausen, and Bergwerksverband GmbH, Firma. Regenerator lining for regenerator chamber cells in coke ovens. 4,167,453, Cl. 202-141.000.

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Kobe Steel, Ltd.: *See—*
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Kohnke, Ole B., to Hess, Ruth Lea. Lung-venting apparatus. 4,167,184, Cl. 128-145.700.

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Kolb, Alfred. Automatically controllable projecting contour grinding machines. 4,167,082, Cl. 51-165.720.

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Kondo, Toshio; Ito, Nobuyuki; Norimatsu, Hideaki; and Kobayashi, Nobuyuki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Air-to-fuel ratio feedback control system with improved transitions between opening and closing of feedback control loop. 4,167,396, Cl. 123-32.0EE.

Kono, Kenichiro; and Ogawa, Yoshio, to Sony Corporation. Television receiver. 4,167,757, Cl. 358-254.000.

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Kormany, Geza, to Ciba-Geigy Corporation. Novel benzoxazole compounds. 4,167,628, Cl. 542-454.000.

Korshak, Vasily V.; Polyakova, Antonina M.; Suchkova, Maria D.; and Mager, Kira A. Adhesive composition. 4,167,546, Cl. 525-275.000.

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Kotyza, Heinrich; and Heinze, Harri, to Salzgitter Maschinen Aktiengesellschaft. Overpressure valve for a hydraulic pit prop. 4,167,198, Cl. 137-528.000.

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Krasser, Fritz, to Ellenberger & Poensgen GmbH. Circuit breaker with switching rocker. 4,167,720, Cl. 337-60.000.

Kraus, Thaddaus, to Balzers Patent- und Beteiligungs Aktiengesellschaft. Method and apparatus for determining the quantity ratio of two components of a multi-substance mixture. 4,167,338, Cl. 356-414.000.

Krause, Edward B.; and Seiden, William. Tamper-proof security alarm system. 4,167,733, Cl. 340-539.000.

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Krenzer, John, to Velsicol Chemical Corporation. 1-Thiadiazolyl-5-acylimidazolidinones. 4,167,407, Cl. 71-90.000.

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Lee, Agnes Y.; Falke, Wilbert L.; and Schwaneke, Alfred E., to United States of America, Interior. Electroplating with Ni-Cu alloy. 4,167,459, Cl. 204-44.000.
Lee, Arnold S. J., to Milstein Medical Research Foundation, Inc. Apparatus for automatically depressurizing a variable-volume inflatable enclosure. 4,167,181, Cl. 128-682.000.
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Lewis, Sheldon N.: *See—*
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Liautaud, James P., to American Antenna Corporation. Injection mold. 4,167,379, Cl. 425-111.000.
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Lichtenstein, Bruno. Pneumatic valve with acoustic alarm for a recipient under pressure. 4,167,149, Cl. 116-34.00R.
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Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, to Bayer Aktiengesellschaft. Thermoplastic molding compositions. 4,167,543, Cl. 525-74.000.
Liebler, Jerome E.; and Rubinstein, Walter M. Color video display for audio signals. 4,167,752, Cl. 358-82.000.
Liedtke, Ronald R., to Shick Incorporated. Rotatable control switch for appliance. 4,167,660, Cl. 200-155.00R.
Liesse, Michel. Mechanically operable acoustic filter. 4,167,223, Cl. 181-131.000.
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Linden, Heinrich; Rutzen, Horst; and Wegemund, Bernd, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Process for dispersing pigments and fillers using aminoalkanols and salt, alkoxylation and quaternization derivatives thereof. 4,167,420, Cl. 106-288.00B.
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Lindsey, Charles T., to Bertea Corporation. Anti-jam mechanism for actuation pistons. 4,167,135, Cl. 92-61.000.
Linz, Arthur: *See—*
Esterowitz, Leon; Bartoli, Filbert J.; Allen, Roger E.; Goldberg, Lawrence S.; Nicolai, Van O.; Kruer, Melvin R.; Linz, Arthur; and Jenssen, Hans P., 4,167,712, Cl. 331-94.50F.
Liquichimica Italiana S.p.A.: *See—*
Petrillo, Vincenzo; and Peditto, Andrea, 4,167,534, Cl. 585-18.000.
Liska, Manfred; Kuhnlein, Hans; Kogler, Georg; and Schalk, Karl, to Siemens Aktiengesellschaft. Control arrangement for a brushless D-C motor. 4,167,693, Cl. 318-138.000.
Litkei, Laszlo: *See—*
Bognar, Rezso; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,167,636, Cl. 546-46.000.
Liu, Chao-Min: *See—*
Westley, John; and Liu, Chao-Min, 4,167,579, Cl. 424-274.000.
Ljung, Bo H. G., to Singer Company, The. Ring laser gyroscope having wedge desensitizing optical means. 4,167,336, Cl. 356-350.000.
Lockheed Corporation: *See—*
Robertson, Arthur J., 4,167,258, Cl. 244-129.500.
Lockwood, Alan C., to Norris Industries, Inc. Electric junction box. 4,167,648, Cl. 174-53.000.
Loeffler, Romain E.; Genson, Samuel R.; and Brunk, Jack L., to Johns-Manville Corporation. Method and apparatus for collecting fibrous material. 4,167,404, Cl. 65-4.00R.
Loewy Robertson Engineering Company Limited: *See—*
Simmonds, Edwin, 4,167,107, Cl. 72-239.000.
Logan, James D.; and Swanson, Guy J., to Watchdog, Inc. Shaft speed and hot bearing indicating apparatus. 4,167,734, Cl. 340-682.000.
Logan, Paul A.; Olivero, Robert C.; Olivero, William C.; and Olivero, Carlo. Heat and sound insulating panel. 4,167,598, Cl. 428-35.000.
Longland, Peter A., to Britax (Wingard) Limited. Rear view mirror assembly. 4,167,306, Cl. 350-289.000.
Looney, Catharine E., to Du Pont de Nemours, E. I., and Company. Flexible ultraviolet radiation transmitting filters. 4,167,490, Cl. 252-300.000.
Lorang, Walter R. Golf putt training apparatus. 4,167,268, Cl. 273-163.00A.
Lord Corporation: *See—*
Jazenski, Peter J.; and Sadowski, John S., 4,167,500, Cl. 260-29.300.
Lousteau, Desire: *See—*
Pichon, Jean-Louis; Lousteau, Desire; and Volat, Jean-Pierre, 4,167,227, Cl. 198-456.000.
Louthan, Clissolde L. Fishing bobber. 4,167,077, Cl. 43-44.880.
Louzos, Demetrios V.; and Brodd, Ralph J., to Union Carbide Corporation. Lithium ion-containing organic electrolyte. 4,167,458, Cl. 204-14.00N.
Lovatt, William J., to Acme Marls Limited. Dust trap. 4,167,391, Cl. 432-258.000.
Lowe, Anthony C.: *See—*
Barclay, Donald J.; Bird, Colin L.; and Lowe, Anthony C., 4,167,308, Cl. 350-357.000.
Barclay, Donald J.; Bird, Colin L.; Lowe, Anthony C.; and Martin, David H., 4,167,309, Cl. 350-357.000.
Lowery, Kirby, Jr. *See—*
Gessell, Donald E.; and Lowery, Kirby, Jr., 4,167,615, Cl. 526-161.000.

Lucas, James G.; and Young, Alan C., to University of Sydney. Instrument landing system glidepath antenna array and drive therefor. 4,167,739, Cl. 343-854.000.

Lucksinger, James E., to Standard Oil Company (Indiana). Vertically moored platform deck casinghead. 4,167,279, Cl. 285-144.000.

Luithlen, Heinz: *See—*
Weiss, Klaus; and Luithlen, Heinz, 4,167,275, Cl. 280-605.000.

Luke, Roger D.; and Rhodes, John M., to Gould Inc. Panelboard having distributed neutral. 4,167,769, Cl. 361-355.000.

Lundmark, Lars E.: *See—*
Hagg, Per B.; Bergstrom, Sven I.; Lundmark, Lars E.; and Hedberg, Carl-Erik L., 4,167,378, Cl. 425-82.100.

Lunt, Edward: *See—*
Knowles, Philip; Lunt, Edward; Marshall, Stuart M.; and Ford, Roger E., 4,167,568, Cl. 424-251.000.

Lyczkowski, Mariusz: *See—*
Czarnecki, Lech; Lyczkowski, Mariusz; and Borowiak, Marek, 4,167,611, Cl. 521-88.000.

Lynk, Edgar T., to General Electric Company. Peak detecting digital scan converter. 4,167,753, Cl. 358-140.000.

Mach, Guido. Process for de-salting of water and apparatus for performing this process. 4,167,480, Cl. 210-23.00H.

Maes, Andre P. A.: *See—*
Cremers, Adrien E. J.; Maes, Andre P. A.; and Piegneur, Paul G. L., 4,167,481, Cl. 210-36.000.

Mager, Kira A.: *See—*
Korshak, Vasily V.; Polyakova, Antonina M.; Suchkova, Maria D.; and Mager, Kira A., 4,167,546, Cl. 525-275.000.

Magnus, Harve W.; and Masur, Vincent J. Apparatus for cleaning jet engine nozzles. 4,167,193, Cl. 134-95.000.

Magnusson, Gerda: *See—*
Elbe, Maximo, 4,167,085, Cl. 51-229.000.

Makarov, Grigory A.: *See—*
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.

Maki, Toshio; Oki, Isao; and Shirai, Kiyoshi. Directional change-over valve. 4,167,197, Cl. 137-271.000.

Makino, Yoshimi: *See—*
Shimizu, Hidetoshi; Tamura, Hidemasa; and Makino, Yoshimi, 4,167,725, Cl. 338-35.000.

Makleit, Sandor: *See—*
Bognar, Rezso; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,167,636, Cl. 546-46.000.

Makosch, Guenter: *See—*
Jaerisch, Walter; Makosch, Guenter; and Schmackpfeffer, Arno, 4,167,337, Cl. 356-354.000.

Malafouris, Dannie O., to Barbecue Time, Inc. Self-extinguishing hibachi-type grill combination. 4,167,175, Cl. 126-25.00C.

Mallay, John B., to Muesco-Mallay Houston, Inc. Extrusion die plate construction. 4,167,386, Cl. 425-463.000.

Manabe, Seiji: *See—*
Horiuchi, Tatsuya; Nawa, Michio; Tsujimura, Akira; Kubota, Mitsuru; Osada, Tomoaki; Manabe, Seiji; and Iwasawa, Hiromu, 4,167,218, Cl. 173-163.000.

Mann, George, to Smiths Industries Limited. Display systems. 4,167,113, Cl. 73-178.00R.

Markum, Donnie D. Method and apparatus for improving poultry feed conversion. 4,167,153, Cl. 119-51.00R.

Marmo, Anthony R., to Westinghouse Electric Corp. Centerless grinder. 4,167,081, Cl. 51-103.0TF.

Marquez, Victor E., to Laboratorios Cosmos S.A. Anaphylactic inhibitors. 4,167,577, Cl. 424-273.00P.

Marshall, Robert E.: *See—*
Christenson, Dempster S.; Gordon, Michael F.; Kistler, Roland D.; Kriegler, Frank J.; Lampert, Seymour R.; Marshall, Robert E.; McLaughlin, Rowland H.; and Smith, Vernon H., 4,167,729, Cl. 340-146.3AH.

Marshall, Stuart M.: *See—*
Knowles, Philip; Lunt, Edward; Marshall, Stuart M.; and Ford, Roger E., 4,167,568, Cl. 424-251.000.

Martin, Barrie J.; and Hall, Samuel S., to Plessey Handel und Investments AG. Fuel injection apparatus. 4,167,158, Cl. 123-32.0EA.

Martin, David H.: *See—*
Barclay, Donald J.; Bird, Colin L.; Lowe, Anthony C.; and Martin, David H., 4,167,309, Cl. 350-357.000.

Martin, Leslie W.; and LeBeau, Richard A., to Unarco Industries, Inc. Buckle supporting and anti-pilfering assembly. 4,167,144, Cl. 105-467.000.

Martin, Robert J., III, to General Electric Company. Circuit for controlling the response conditions of a radio receiver. 4,167,705, Cl. 325-478.000.

Maschinenfabrik Augsburg-Nuernberg Aktiengesellschaft: *See—*
Geyer, Ludwig, 4,167,286, Cl. 296-178.000.

Mashimo, Yukio: *See—*
Sakurada, Nobuaki; Shinoda, Nobuhiko; Ito, Tadashi; Mashimo, Yukio; and Ito, Fumio, 4,167,332, Cl. 356-227.000.

Mason Fence Company, The: *See—*
Spencer, Donald B., 4,167,281, Cl. 292-216.000.

Masri, Merle S.; Randall, Virginia G.; and Stanley, William L. Method for insolubilizing enzymes on chitosan. 4,167,447, Cl. 435-178.000.

Massachusetts Institute of Technology: *See—*
Graneau, Peter; Silevitch, Michael B.; and Ames, Elizabeth E., 4,167,370, Cl. 417-48.000.
Ramos, Alonso R.; and Cohen, Robert E., 4,167,544, Cl. 525-99.000.

Mastroianni, Emilio G.: *See—*
Feitzinger, Eduard; and Mastroianni, Emilio G., 4,167,319, Cl. 354-300.000.

Masur, Vincent J.: *See—*
Magnus, Harve W.; and Masur, Vincent J., 4,167,193, Cl. 134-95.000.

Mathieu, Charles, to Frankel, Willy; and Frankel, Claudia. Vibration damper. 4,167,646, Cl. 174-42.000.

Matsuda, Tsuneki. Automatic cutoff and tester apparatus of gas supply. 4,167,194, Cl. 137-38.000.

Matsumoto, Yasushi: *See—*
Hanajima, Mitsuru; Tezuka, Masaru; and Matsumoto, Yasushi, 4,167,764, Cl. 360-90.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Ohkubo, Masaru, 4,167,661, Cl. 219-10.55F.
Tomimoto, Tetsuo; Nagaoka, Yoshitomi; and Sasaki, Reiichi, 4,167,750, Cl. 358-27.000.

Matsushita Electric Works, Ltd.: *See—*
Sakamoto, Yoshihiro, 4,167,060, Cl. 30-43.920.
Yamamura, Yukio; Hamabe, Takafumi; and Sugai, Haruo, 4,167,182, Cl. 128-56.000.

Matsushita, Yukio; and Handa, Kenichi, to Yamaha Hatsudoki Kabushiki Kaisha. Two cycle loop scavenging engine having unequal scavenging passage openings. 4,167,160, Cl. 123-73.00A.

Matsuyama, Mitsunobu, to Nissan Motor Company, Limited. Impact absorbing type bumper. 4,167,282, Cl. 293-102.000.

Matukura, Yoshiharu: *See—*
Mikura, Yasushi; Matukura, Yoshiharu; and Fujisawa, Hiroshi, 4,167,563, Cl. 424-177.000.

Mauch, John W., to United States of America, Navy. Precision ultrasonic evaluation and recording system. 4,167,121, Cl. 73-640.000.

Maul, Peter L.: *See—*
Hughes, John; and Maul, Peter L., 4,167,398, Cl. 44-17.000.

Max-Planch-Gesellschaft zur Forderung der Wissenschaften: *See—*
Wunsch, Erich, 4,167,508, Cl. 260-112.50R.

Maxant Corporation, The: *See—*
Ptasinski, Leo D.; and Ferguson, Bruce A., 4,167,053, Cl. 24-113.00R.

May & Baker Limited: *See—*
Knowles, Philip; Lunt, Edward; Marshall, Stuart M.; and Ford, Roger E., 4,167,568, Cl. 424-251.000.

McCall, John M., to Upjohn Company, The. Antihypertensive 4-aminoquinolines. 4,167,567, Cl. 424-250.000.

McCaughna, James R. Thermal switches. 4,167,724, Cl. 337-408.000.

McDonnell Douglas Corporation: *See—*
Pund, Marvin L., 4,167,311, Cl. 353-99.000.

McKay, Dwight L.: *See—*
Bertus, Brent J.; and McKay, Dwight L., 4,167,471, Cl. 208-74.000.

McLaughlin, Rowland H.: *See—*
Christenson, Dempster S.; Gordon, Michael F.; Kistler, Roland D.; Kriegler, Frank J.; Lampert, Seymour R.; Marshall, Robert E.; McLaughlin, Rowland H.; and Smith, Vernon H., 4,167,729, Cl. 340-146.3AH.

McMillin, Charles W.; and Koch, Peter, to United States of America, Agriculture. Sequential velocity disk refiner. 4,167,250, Cl. 241-251.000.

McNichols, Larry A.: *See—*
Sorenson, Paul D.; and McNichols, Larry A., 4,167,190, Cl. 128-423.00R.

McQuade, Daniel J.: *See—*
Coe, Richard H.; McQuade, Daniel J.; and Weiss, David L., 4,167,700, Cl. 325-32.000.

McQueen, Robert W., to Dresser Industries, Inc. Viscous pump rock bit lubrication system. 4,167,219, Cl. 175-229.000.

McReynolds, Marshall B.; and Van Tilbury, Jack D., to Trac Incorporated. Average-mode traffic control system. 4,167,784, Cl. 364-436.000.

McReynolds, Marshall B.; Van Tilbury, Jack D.; and Oscar, Irving S., to Trac Incorporated. Traffic coordinator for arterial traffic system. 4,167,785, Cl. 364-437.000.

Mead Corporation, The: *See—*
Gebhardt, James L., 4,167,353, Cl. 403-231.000.
Head, Donald L.; and Howard, Robert C., 4,167,742, Cl. 346-75.000.

Medtronic, Inc.: *See—*
Sorenson, Paul D.; and McNichols, Larry A., 4,167,190, Cl. 128-423.00R.

Medwed, Emmerich, to Multivac Sepp Haggenmuller KG. Sealing device for packaging machine. 4,167,092, Cl. 53-373.000.

Mehta, Arun K.; Bozzuto, Carl R.; and Kantesaria, Prabhudas P., to Combustion Engineering, Inc. Method for removing sulfur and nitrogen compounds from a gas mixture. 4,167,578, Cl. 423-235.000.

Melillo, David G.: *See—*
Tull, Roger J.; and Melillo, David G., 4,167,640, Cl. 562-405.000.

Melnyk, George G., to Arthur G. McKee & Company. Scrubber having fixed throat venturi and adjustable plug. 4,167,401, Cl. 55-224.000.

Mercer, Alec V.: *See—*
Fleck, Fritz; Mercer, Alec V.; and Paver, Roger, 4,167,626, Cl. 542-435.000.

Merck & Co., Inc.: *See*—
Firestone, Raymond A., 4,167,630, Cl. 544-90.000.
Tull, Roger J.; and Melillo, David G., 4,167,640, Cl. 562-405.000.
Mergenthaler, Waldemar: *See*—
Tschersich, Erwin; Mergenthaler, Waldemar; Pamukcu, Ali; and Kaiser, Klaus, 4,167,203, Cl. 141-59.000.
Merkert, Rodney F.: *See*—
Downing, James H.; and Merkert, Rodney F., 4,167,409, Cl. 75-129.000.
Merz, Theodore P.: *See*—
Kock, Ronald W.; Merz, Theodore P.; and Platt, Paul K., 4,167,245, Cl. 239-11.000.
Messina, Roland. Collapsible campers. 4,167,284, Cl. 296-171.000.
Metals Research Limited: *See*—
Fisher, Colin, 4,167,554, Cl. 422-246.000.
Metrailer, Albert C.: *See*—
Stoltz, Richard A.; and Metrailer, Albert C., 4,167,213, Cl. 166-251.000.
Michel, George H. Deodorizing breath composition. 4,167,559, Cl. 424-58.000.
Mickelson, Richard C. Planter having self-indexing drain dish. 4,167,080, Cl. 47-71.000.
Midland-Ross Corporation: *See*—
Thekdi, Arvind C., 4,167,212, Cl. 165-134.00R.
Mikata, Tsuruo: *See*—
Yamanaka, Makoto; Mikata, Tsuruo; Takano, Satoshi; Okamoto, Kikuhiko; and Saito, Fumio, 4,167,518, Cl. 260-397.250.
Mikura, Yasushi; Matukura, Yoshiharu; and Fujisawa, Hiroshi, to Takeda Chemical Industries, Ltd. TRH Solution. 4,167,563, Cl. 424-177.000.
Mile, Terez: *See*—
Bognar, Rezso; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,167,636, Cl. 546-46.000.
Mileage Research, Ltd.: *See*—
Varner, William L.; and Willis, Billy R., 4,167,166, Cl. 123-122.00D.
Miles, Steven G.: *See*—
Kurth, William T.; and Miles, Steven G., 4,167,644, Cl. 136-89.0EP.
Millar, Robert F.: *See*—
Persico, Paul J.; Millar, Robert F.; and Jensen, Robert H., 4,167,553, Cl. 422-216.000.
Miller, Arthur F.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 4,167,494, Cl. 252-432.000.
Miller, Don R., to U-Brand Corporation. Valve. 4,167,195, Cl. 137-269.000.
Miller, Edward B.; and Eichelberger, Charles W., to General Electric Company. Load control processor. 4,167,786, Cl. 364-493.000.
Miller, Everett R., to Owens-Corning Fiberglas Corporation. Method for cutting sheet moulding compound reinforcing strands. 4,167,130, Cl. 83-866.000.
Miller, George A.; and Lewis, Sheldon N., to Rohm and Haas Company. 3-Alkoxyisothiazoles. 4,167,575, Cl. 424-270.000.
Miller, George A.; and Chan, Hak-Foon, to Rohm and Haas Company. Cyanoaralkylheterocyclic compounds. 4,167,576, Cl. 424-273.00R.
Miller, John J.: *See*—
Lewis, Sheldon N.; and Miller, John J., 4,167,502, Cl. 260-29.60H.
Miller, Thomas G.; Rogers, Billie O.; and Roberts, Thomas G., to United States of America, Army. Multi-grating attenuator for high power pulsed laser beams. 4,167,666, Cl. 250-216.000.
Milliken Research Corporation: *See*—
Brendle, Ralph N., 4,167,510, Cl. 260-174.000.
Mills, Brendon W. Play apparatus for live animal. 4,167,152, Cl. 119-15.000.
Mills, Stuart D., to Imperial Chemical Industries Limited. Pyrimido[1,2-a]benzimidazole derivatives. 4,167,569, Cl. 424-251.000.
Milstein Medical Research Foundation, Inc.: *See*—
Lee, Arnold S. J., 4,167,181, Cl. 128-682.000.
Mine Safety Appliances Company: *See*—
Petro, Michael; Betz, Joseph R.; and DeArmitt, Duane W., 4,167,361, Cl. 405-290.000.
Minematsu, Hiroyoshi: *See*—
Shimada, Keizo; Harada, Toshiaki; Koga, Masahiro; Nagahama, Shizuo; Minematsu, Hiroyoshi; and Yoshida, Hidetsugu, 4,167,506, Cl. 260-37.00N.
Minnesota Mining and Manufacturing Company: *See*—
Siefken, Mark W., 4,167,617, Cl. 528-23.000.
Minolta Camera Kabushiki Kaisha: *See*—
Kawamura, Kunio, 4,167,317, Cl. 354-269.000.
Nanba, Yasuhiro; Beppu, Norio; and Yamada, Seiji, 4,167,315, Cl. 354-106.000.
Mischo, Klaus; and Paulus, Rudolf, to AGFA-Gevaert, A.G. Method and apparatus for ascertaining the positions of film frames. 4,167,678, Cl. 250-559.000.
Mitchell, William P. Portable lighting system having a foot operated dimmer. 4,167,783, Cl. 362-236.000.
Mitel Corporation: *See*—
Durance, Robert A.; and Cribb, John A., 4,167,656, Cl. 179-175.20R.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Kinase, Takeo; Orii, Katsuo; Hosaka, Hiroaki; and Ito, Kiyoshi, 4,167,224, Cl. 182-48.000.
Morikawa, Masahiro, 4,167,484. Cl. 250-533.000.
Yamanaka, Takashi; and Kondo, Keikichi, 4,167,659, Cl. 200-153.00E.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Taniyama, Susumu; Takanohashi, Hiromitsu; and Inoue, Shoichi, 4,167,537, Cl. 525-443.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Nakagami, Tatsuro, 4,167,161, Cl. 123-75.00B.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Ueda, Shoji; Daikoku, Takashi; Takeda, Yorimasa; Hiromoto, Akira; Nagai, Nobuyuki; Moriguchi, Yasuo; and Ito, Yoshimasa, 4,167,427, Cl. 148-133.000.
Mitsubishi Petrochemical Company Limited: *See*—
Tamura, Noriyoshi; and Kihara, Kunio, 4,167,551, Cl. 521-27.000.
Miyashita, Kiyoshi; and Kimura, Katsuhiko, to Olympus Optical Co., Ltd. Photosensitive drum for electrographic apparatus. 4,167,321, Cl. 355-3.0DR.
Mizoguchi, Yoshiro: *See*—
Akazawa, Haluichi; and Okada, Kiyoshi, 4,167,248, Cl. 239-683.000.
Mizuguchi, Hideki: *See*—
Shirato, Toru; Yoshida, Minoru; and Mizuguchi, Hideki, 4,167,384, Cl. 425-183.000.
Mo och Domsjo AB: *See*—
Hagg, Per B.; Bergstrom, Sven I.; Lundmark, Lars E.; and Hedberg, Carl-Erik L., 4,167,378, Cl. 425-82.100.
Mobil Oil Corporation: *See*—
Rowe, Carleton N., 4,167,486, Cl. 252-56.00R.
Moder, Helmut, to Robert Bosch GmbH. Sensor monitoring apparatus. 4,167,163, Cl. 123-119.0EC.
Moisson, Rene: *See*—
Gillonnier, Claude; and Moisson, Rene, 4,167,522, Cl. 260-501.140.
Mollura, Carlos A. Process of making a water bed mattress. 4,167,432, Cl. 156-273.000.
Molnar, Frank J., to Textron Inc. Slide fastener with cross oriented polymer tapes. 4,167,055, Cl. 24-205.16C.
Monsanto Company: *See*—
Serlin, Irving, 4,167,602, Cl. 428-240.000.
Uriarte, Anthony K.; and Vaughan, James H., 4,167,528, Cl. 260-654.00A.
Montedison S.p.A.: *See*—
Musco, Alfredo; Santi, Roberto; and Chiusoli, Gian P., 4,167,513, Cl. 260-343.500.
Moody, Victor: *See*—
Chandler, Arthur R.; and Moody, Victor, 4,167,128, Cl. 81-66.00R.
Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. 1-(2,6,6-Trimethyl-1,3-cyclohexadien-1-yl)-1,3-butanedione and perfume compositions. 4,167,497, Cl. 252-522.000.
Moore Industries Inc.: *See*—
Bodle, Ronald L.; and Dolby, Gareth B., 4,167,706, Cl. 328-26.000.
Morgan Adhesives Company: *See*—
Wong, Tony K. M., 4,167,431, Cl. 156-244.110.
Morgan, James G., to Du Pont de Nemours, E. I., and Company. Reflective opaque polyester film base support for inverse transfer negative emulsions. 4,167,414, Cl. 96-87.00R.
Morgan, Ronald W. Universal drapery making equipment. 4,167,434, Cl. 156-510.000.
Moriguchi, Yasuo: *See*—
Ueda, Shoji; Daikoku, Takashi; Takeda, Yorimasa; Hiromoto, Akira; Nagai, Nobuyuki; Moriguchi, Yasuo; and Ito, Yoshimasa, 4,167,427, Cl. 148-133.000.
Morikawa, Masahiro, to Mitsubishi Denki Kabushiki Kaisha. Ozone generating apparatus. 4,167,484, Cl. 250-533.000.
Morita, Tuneo: *See*—
Ishibashi, Masayuki; and Morita, Tuneo, 4,167,745, Cl. 357-23.000.
Morley Studios: *See*—
High, Cliff R.; and Falaschi, Karl D., 4,167,344, Cl. 400-130.000.
Morris, Earl L., to Acorn Engineering Co. Vandal-proof plumbing valve access box. 4,167,196, Cl. 137-360.000.
Morrow, Thomas J., to United States of America, Health, Education and Welfare. Preparation of 2,4,5,6-tetraaminopyrimidine from 2,4,6-triaminopyrimidine. 4,167,633, Cl. 544-323.000.
Morton, Kim L.: *See*—
Beckenbaugh, William M.; and Morton, Kim L., 4,167,601, Cl. 428-209.000.
Motorola, Inc.: *See*—
Anderson, Jack L.; Swiatowiecz, Frank J.; and Glazer, Marvin A., 4,167,727, Cl. 340-146.1AG.
Christ, Allen E.; Sprague, Dennis R.; and Ziegner, Bernhard A., 4,167,413, Cl. 96-36.200.
Coe, Richard H.; McQuade, Daniel J.; and Weiss, David L., 4,167,700, Cl. 325-32.000.
Smoot, George W., 4,167,711, Cl. 331-17.000.
Mourier, Georges, to Thomson-CSF. Process and apparatus for separating isotopes. 4,167,668, Cl. 250-291.000.
Mouzin, Gilbert: *See*—
Pitet, Guy; Cousse, Henri; Mouzin, Gilbert; and Delhon, Andre, 4,167,566, Cl. 42-249.000.
Mower, Dan C.; Wolf, Peter H.; Slade, Boyd E.; and Albertalli, David, to Dataproducts Corporation. Control system for matrix print head. 4,167,342, Cl. 400-124.000.
Muecke, Thomas W.: *See*—
Stokley, Charles O.; Muecke, Thomas W.; Gruesbeck, Clay, Jr.; and Salathiel, William M., 4,167,117, Cl. 73-422.00R.
Mues, Volker; and Niggemann, Johannes, to Bayer Aktiengesellschaft. Fertilizers for supplying plants with iron. 4,167,405, Cl. 71-27.000.

Muesco-Mallay Houston, Inc.: *See*—
Mallay, John B., 4,167,386, Cl. 425-463.000.
Muller, Hans. Filtering method and apparatus. 4,167,482, Cl. 210-68.000.
Multivac Sepp Haggenmuller KG: *See*—
Medwed, Emmerich, 4,167,092, Cl. 53-373.000.
Mundschenk, Glenn R., to General Electric Company. Power cord strain relief. 4,167,301, Cl. 339-105.000.
Munk, Edmund; Weinberg, Gerd; and Henke, Hermann, to J. F. Werz Jr. KG Werzalit-Prssholzwerk. Box composed of pressed materials for shipping fruits, vegetables. 4,167,232, Cl. 206-509.000.
Murakami, Hiroyashu: *See*—
Shinoda, Nobuhiko; Sakurada, Nobuaki; Kawamura, Masaharu; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, 4,167,312, Cl. 354-23.00D.
Murakami, Kenkichi; and Kikuzawa, Yoshiharu, to Kabushiki Kaisha Plastic Kogaku Kenkyusho. Multi-ring die. 4,167,383, Cl. 425-462.000.
Muraoka, Mamoru; Shimada, Kikuo; Komada, Hiroshi; and Gami, Toshiyuki, to Sumitomo Heavy Industries, Ltd.; and Nihon Soflan Chemical & Engineering Co. Ltd. Automatic spraying apparatus for forming hard polyurethane foam coating. 4,167,151, Cl. 118-665.000.
Murase, Kiyoshi: *See*—
Yoshida, Morio; Asato, Ikuo; Semba, Toru; and Murase, Kiyoshi, 4,167,597, Cl. 427-407.00B.
Murtaugh, Justin J., to Drackett Company, The. Hard surface cleaning compositions. 4,167,488, Cl. 252-160.000.
Murtha, Timothy P., to Phillips Petroleum Co. Extractive distillation to separate cyclohexylbenzene from phenol-cyclohexanone mixture containing the same. 4,167,456, Cl. 203-63.000.
Musco, Alfredo; Santi, Roberto; and Chiusoli, Gian P., to Montedison S.p.A. Synthesis of unsaturated esters and lactone from butadiene and carbon dioxide. 4,167,513, Cl. 260-343.500.
Nagahama, Shizuo: *See*—
Shimada, Keizo; Harada, Toshiaki; Koga, Masahiro; Nagahama, Shizuo; Minematsu, Hiroyoshi; and Yoshida, Hidetsugu, 4,167,506, Cl. 260-37.00N.
Nagai, Nobuyuki: *See*—
Ueda, Shoji; Daikoku, Takashi; Takeda, Yorimasa; Hiromoto, Akira; Nagai, Nobuyuki; Moriguchi, Yasuo; and Ito, Yoshimasa, 4,167,427, Cl. 148-133.000.
Nagaoka, Yoshitomi: *See*—
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Nagumo, Fumio; and Yamamoto, Kaichi, to Sony Corporation. Solid state television camera with noise eliminating circuit. 4,167,754, Cl. 358-167.000.
Nagumo, Fumio, to Sony Corporation. Solid state television camera. 4,167,755, Cl. 358-213.000.
Nakagami, Tatsuro, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Directional auxiliary intake injection for internal combustion engine. 4,167,161, Cl. 123-75.00B.
Nakagawa, Tohru: *See*—
Takamaru, Takeshi; and Nakagawa, Tohru, 4,167,547, Cl. 261-44.00C.
Nakamura, Isao: *See*—
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Nakayama, Hiroyuki: *See*—
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Nakazawa, Hiroshi: *See*—
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Nanba, Yasuhiro; Beppu, Norio; and Yamada, Seiji, to Minolta Camera Kabushiki Kaisha. Apparatus for dating camera film. 4,167,315, Cl. 354-106.000.
Naruse, Tunehide: *See*—
Takahashi, Noboru; Ozaki, Sadao; Naruse, Tunehide; Isono, Hiromasa; and Nishihara, Toshikazu, 4,167,582, Cl. 428-328.000.
National Research Development Corporation: *See*—
Bates, James J., 4,167,685, Cl. 310-237.000.
Steen, William M., 4,167,662, Cl. 219-121.00L.
National Semiconductor Corporation: *See*—
Wilcox, Milton E., 4,167,751, Cl. 358-30.000.
National Starch and Chemical Corporation: *See*—
Tessler, Martin M., 4,167,621, Cl. 536-108.000.
National Steel Corporation: *See*—
Jubenville, Duncan; and Kenney, Donald J., 4,167,424, Cl. 134-1.000.
Nattel, William, to GTE Sylvania Canada Limited. Knockout extracting tool. 4,167,056, Cl. 29-267.000.
Nauchno-Issledovatelsky I Proektno-Konstruktorsky Institut Po Dobyche: *See*—
Brjukhov, Boris F.; Buchin, Nikolai B.; and Shilov, Vasily P., 4,167,119, Cl. 73-488.000.
Naumann, Hans J.: *See*—
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Nawa, Michio: *See*—
Horiuchi, Tatsuya; Nawa, Michio; Tsujimura, Akira; Kubota, Mitsuru; Osada, Tomoaki; Manabe, Seiji; and Iwasawa, Hiromu, 4,167,218, Cl. 173-163.000.
Nelson, Donald L., to Dow Chemical Company, The. Polyester resin compositions containing dicyclopentadiene alkenoate. 4,167,542, Cl. 525-445.000.
Nelson, Rolland W., to Kemin Industries, Inc. Stable emulsified edible liquid starch product and method of making the same. 4,167,584, Cl. 426-2.000.
Neujens, Georges J.: *See*—
Stievenart, Emile F.; Plessers, Hendrik S.; and Neujens, Georges J., 4,167,673, Cl. 250-468.000.
Newton, Richard P., Jr.: *See*—
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Nicholson, Eric S.: *See*—
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Nicolai, Van O.: *See*—
Esterowitz, Leon; Bartoli, Filbert J.; Allen, Roger E.; Goldberg, Lawrence S.; Nicolai, Van O.; Kruer, Melvin R.; Linz, Arthur; and Jenssen, Hans P., 4,167,712, Cl. 331-94.50F.
Nielsen, Larry L., to Hewlett-Packard Company. Multi-wavelength incremental absorbence oximeter. 4,167,331, Cl. 356-39.000.
Nielsen, Norman A., to Du Pont de Nemours, E. I., and Company. Methanol oxidation/dehydrogenation over silver-gold alloy. 4,167,527, Cl. 260-603.00C.
Niggemann, Johannes: *See*—
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Nihon Soflan Chemical & Engineering Co. Ltd.: *See*—
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Nikitenko, Valery I.: *See*—
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.
Nippon Electric Company, Ltd.: *See*—
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Nippon Gakki Seizo Kabushiki Kaisha: *See*—
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Nippondenso Co., Ltd.: *See*—
Kondo, Toshio; Ito, Nobuyuki; Norimatsu, Hideaki; and Kobayashi, Nobuyuki, 4,167,396, Cl. 123-32.0EE.
Yamamoto, Yoshihisa, 4,167,168, Cl. 123-139.0AT.
Nishihara, Toshikazu: *See*—
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Nissan Motor Company, Limited: *See*—
Matsuyama, Mitsunobu, 4,167,282, Cl. 293-102.000.
Nissinen, Esko. Mat and units thereof. 4,167,599, Cl. 428-44.000.
Nitto Boseki Co., Ltd.: *See*—
Coggin, Charles H., 4,167,403, Cl. 65-1.000.
Niwano, Masahiro: *See*—
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Nixdorf Computer AG: *See*—
Holland-Letz, Guenter, 4,167,346, Cl. 400-618.000.
Nodiff, Edward A.: *See*—
Chen, Eugene H.; Saggiomo, Andrew J.; and Nodiff, Edward A., 4,167,638, Cl. 546-171.000.
Noguchi, Masaro, to AMP Incorporated. Electrical receptacle with releasable tab latching means. 4,167,299, Cl. 339-59.00R.
Norimatsu, Hideaki: *See*—
Kondo, Toshio; Ito, Nobuyuki; Norimatsu, Hideaki; and Kobayashi, Nobuyuki, 4,167,396, Cl. 123-32.0EE.
Norris Industries, Inc.: *See*—
Lockwood, Alan C., 4,167,648, Cl. 174-53.000.
Noyes, Richard C.; Zaman, Shakir U.; and Stuteville, Douglas W., to Combustion Engineering, Inc. Self-actuated rate of change of pressure scram device for nuclear reactors. 4,167,443, Cl. 176-36.00R.
Nozik, A. J.: *See*—
Dickson, C. R.; and Nozik, A. J., 4,167,461, Cl. 204-102.000.
Nuclear Engineering Company: *See*—
Gablin, Kenneth A.; and Hansen, Larry J., 4,167,491, Cl. 252-301.10W.
Nuyts, Walter L. M. C.; and Vlaeminck, Roger A., to International Standard Electric Corporation. Magnetic bubble domain gate arrangement. 4,167,790, Cl. 365-15.000.
Nygaard, Nils H., to Danfoss A/S. Inverter circuit. 4,167,776, Cl. 363-56.000.
Nyul, Paul, to RCA Corporation. Electroluminescent semiconductor device having optical fiber window. 4,167,744, Cl. 357-17.000.
O. C. Electronics, Inc.: *See*—
Kempe, Robert B., 4,167,651, Cl. 179-1.00J.
Oakley, Samuel T., to International Nickel Company, Inc., The. Powder rolling apparatus. 4,167,377, Cl. 425-79.000.
Oase, Vernon S., to Owens-Corning Fiberglas Corporation. Eccentricity eliminating cable-fabric connection apparatus for air supported roof structures. 4,167,086, Cl. 52-2.000.
Occidental Oil Shale, Inc.: *See*—
Ridley, Richard D., 4,167,291, Cl. 299-2.000.
Occidental Petroleum Corporation: *See*—
Wahl, Edward F., III; and Boucher, Frederic B., 4,167,099, Cl. 60-641.000.
Ochiai, Kazuo: *See*—
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O'Dea, Orrin B., to Communication Manufacturing Co. Overshoot suppression circuitry for ternary pulses. 4,167,682, Cl. 307-237.000.
O'Dell, Larry A., to Dresser Industries, Inc. Sprocket tightener. 4,167,293, Cl. 299-82.000.
Odhelius, Gustaf H. V.: *See*—
Braugenhardt, Anders E. S.; Hedin, Nils A.; Odhelius, Gustaf H. V.; and Anas, Johan O., 4,167,652, Cl. 179-15.0AT.
Oettel, Michael: *See*—
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Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.
Ohkubo, Masaru, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 4,167,661, Cl. 219-10.55F.
Ohm, Edward A., to Bell Telephone Laboratories, Incorporated. Wideband polarization coupler. 4,167,715, Cl. 333-125.000.
Ohsawa, Mitsuo; Nakazawa, Hiroshi; and Yamagishi, Hiroshi, to Sony Corporation. Current mirror circuit and apparatus for using same. 4,167,649, Cl. 179-1.0GE.
Ohuchi, Shigehiro: *See*—
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Okada, Kiyoshi: *See*—
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Okamoto, Kikuhiko: *See*—
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Okazaki, Hiroshi; Suzuki, Toshio; Kondo, Takeo; and Hiraiwa, Nobuo, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for mounting a hub cap to a wheel. 4,167,294, Cl. 301-108.00R.
O'Keefe, Daniel A.: *See*—
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Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,167,469, Cl. 204-296.000.
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Olivero, Robert C.: *See*—
Logan, Paul A.; Olivero, Robert C.; Olivero, William C.; and Olivero, Carlo, 4,167,598, Cl. 428-35.000.
Olivero, William C.: *See*—
Logan, Paul A.; Olivero, Robert C.; Olivero, William C.; and Olivero, Carlo, 4,167,598, Cl. 428-35.000.
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Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,167,220, Cl. 175-337.000.
Olschewski, Hans J., to FKF Berlin Fleischwaren- und Konservenfabrik Schulz & Berndt GmbH & Co. Apparatus for sealing plastics/-metal laminates. 4,167,435, Cl. 156-583.100.
Olympus Optical Co., Ltd.: *See*—
Miyashita, Kiyoshi; and Kimura, Katsuhiko, 4,167,321, Cl. 355-3.0DR.
Satoh, Ken; and Fukuoka, Norio, 4,167,787, Cl. 364-705.000.
Tsunefuji, Katsuhiko, 4,167,313, Cl. 354-31.000.
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Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.
Ono, Kozo; and Suda, Masao, to Hitachi Construction Machinery Co., Ltd. Method and system for controlling earth pressure in tunnel boring or shield machine. 4,167,289, Cl. 299-1.000.
Onushco, Andrew J., to Envirotech Corporation. Electrode restraining assembly in an electrostatic precipitator. 4,167,400, Cl. 55-146.000.
Optac Wilfrid Weltin: *See*—
Hartig, Guenter, 4,167,043, Cl. 2-423.000.
Oquita, Ramiro M. Pull-pin pinata. 4,167,078, Cl. 46-11.000.
Orden, Burt B. Educational lung simulator. 4,167,070, Cl. 35-17.000.
Ordynsky, Georgy V.: *See*—
Timofeev, Alexandr V.; Batjukov, Vladimir I.; Fadeev, Alexandr I.; Shapkin, Alexandr F.; Shkhiyan, Tsolak G.; Ordynsky, Georgy V.; Drachev, Viktor P.; and Pogodin, Evgeny N., 4,167,442, Cl. 176-30.000.
Orii, Katsuo: *See*—
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Orr, F. Donald, Jr.; Templeton, Larry F.; and Keutzer, Larry L., to Accelerators, Inc. Ozone generation apparatus and method. 4,167,466, Cl. 204-176.000.
Osada, Tomoaki: *See*—
Horiuchi, Tatsuya; Nawa, Michio; Tsujimura, Akira; Kubota, Mitsuru; Osada, Tomoaki; Manabe, Seiji; and Iwasawa, Hiromu, 4,167,218, Cl. 173-163.000.
Oscar, Irving S.: *See*—
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Osman, Maged A., to BBC Brown Boveri & Company, Limited. Liquid crystalline compounds. 4,167,489, Cl. 252-299.000.
Ott, Karl-Heinz: *See*—
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Ovutime, Inc.: *See*—
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Owens-Corning Fiberglas Corporation: *See*—
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Miller, Everett R., 4,167,130, Cl. 83-866.000.
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Oxy Metal Industries Corporation: *See*—
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Ozaki, Sadao: *See*—
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Pacific Technology, Inc.: *See*—
Leyde, Warren L.; and Hall, Don R., 4,167,679, Cl. 307-35.000.
Page, Joe W., Jr.; and Stahlhuth, Paul H., to Den-Tal-Ez Mfg. Co. Dental handpiece. 4,167,062, Cl. 32-26.000.
Paitula, Hannu O.; and Larsson, Roland A., to Granges Essem Aktiebolag. Locking device for vehicle safety seat belts. 4,167,254, Cl. 242-107.40A.
Pamukcu, Ali: *See*—
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Panepinto, William, Jr.: *See*—
Joyce, Thomas F.; Holtey, Thomas O.; and Panepinto, William, Jr., 4,167,782, Cl. 364-200.000.
Panico, C. Richard, to Xenon Corporation. Apparatus for rapid curing of resinous materials and method. 4,167,669, Cl. 250-341.000.
Papson, John C., to Communication Associates, Inc. Push-pull amplifier output circuit. 4,167,709, Cl. 330-276.000.
Papst, Hermann, to Papst-Motoren KG. Axial fan. 4,167,376, Cl. 417-354.000.
Papst-Motoren KG: *See*—
Papst, Hermann, 4,167,376, Cl. 417-354.000.
Parton, Brian, to Imperial Chemical Industries Limited. Water soluble cationic azo dyestuffs. 4,167,509, Cl. 260-156.000.
Pass, Raymond V., to AMP Incorporated. Adjustable read head assembly. 4,167,664, Cl. 235-449.000.
Paulson, Garry E.: *See*—
Gabel, Lorne G.; Paulson, Garry E.; and Kirk, Thomas G., 4,167,592, Cl. 427-137.000.
Paulus, Rudolf: *See*—
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Paver, Roger: *See*—
Fleck, Fritz; Mercer, Alec V.; and Paver, Roger, 4,167,626, Cl. 542-435.000.
Payne, John M. Contact electrostatic photocopying process and apparatus forming reversed image master using web-type photoconductive surface. 4,167,326, Cl. 355-16.000.
Peachtree Doors, Inc.: *See*—
Governale, Bernard C., 4,167,088, Cl. 52-207.000.
Pedersen, Hans K.: *See*—
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Pennings, Matheus D.: *See*—
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Pennwalt Corporation: *See*—
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Perkin-Elmer Corporation, The: *See*—
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Persha, Thomas J.; Lehto, Eino M.; Dueck, Richard; and Hechimovich, Nick, to Bell & Howell Company. Lamp assembly and power module for fanless microfiche reader. 4,167,310, Cl. 353-52.000.
Persico, Paul J.; Millar, Robert F.; and Jensen, Robert H., to UOP Inc. Catalytic reaction chamber for gravity-flowing catalyst particles. 4,167,553, Cl. 422-216.000.
Pertec Computer Corporation: *See*—
Baehne, James R., 4,167,772, Cl. 361-399.000.

Peters, Victor; and Krammer, Franz, to Alkor Gesellschaft mit beschrankter Haftung Kunststoffverkauf. Method of printing on plastic foil. 4,167,595, Cl. 427-256.000.

Peterson, Frank C.: *See—*
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,167,539, Cl. 525-117.000.

Petrillo, Vincenzo; and Peditto, Andrea, to Liquichimica Italiana S.p.A. Process for the preparation of synthetic lubricating oils. 4,167,534, Cl. 585-18.000.

Petro, Michael; Betz, Joseph R.; and DeArmitt, Duane W., to Mine Safety Appliances Company. Temporary mine roof prop. 4,167,361, Cl. 405-290.000.

Pfeiffer, Rainer; Baasner, Udo; and Hugendubel, Fritz, to Fritz Roth KG. Lawn mower. 4,167,093, Cl. 56-17.200.

Pfitzenmaier, Gerhard, to Siemens Aktiengesellschaft. Microwave filter employing a theoretical minimum number of couplings. 4,167,713, Cl. 333-212.000.

Philippe, Pierre D. P.: *See—*
Bolus, Daniel M. A. F.; Chevillon, Jean P.; Conte, Jean C.; and Philippe, Pierre D. P., 4,167,654, Cl. 179-81.00R.

Phillips, David W.: *See—*
Heard, Roderick S.; and Phillips, David W., 4,167,741, Cl. 346-75.000.

Phillips, Ernest L., to Jet Accessories, Inc. Generator drive control system. 4,167,695, Cl. 322-12.000.

Phillips, Lawrence D., to Phillips Petroleum Co. Flame head for flame photometric detector used in gas chromatography. 4,167,334, Cl. 356-315.000.

Phillips Petroleum Co.: *See—*
Bard, William B., 4,167,455, Cl. 203-2.000.
Bertus, Brent J.; and McKay, Dwight L., 4,167,471, Cl. 208-74.000.
Dick, James E.; Sherk, Fred T.; and Drehman, Lewis E., 4,167,472, Cl. 208-80.000.
Murtha, Timothy P., 4,167,456, Cl. 203-63.000.
Phillips, Lawrence D., 4,167,334, Cl. 356-315.000.
Potts, Mack F., 4,167,531, Cl. 585-854.000.
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Pletscher, Gebrueder: *See—*
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Pommer, Ernst-Heinrich: *See—*
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Quirke, Patric C., to Whitewater Electronics, Inc. Solid state lamp ballast. 4,167,689, Cl. 315-206.000.

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Rachmilewitz, Bracha: *See—*
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Raddatz, Andrea E.: *See—*
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Rao, Vemulapalli D. N.; and Jaimee, Angelo, to Ford Motor Company. Method of making low cost cast-in-place port liner. 4,167,207, Cl. 164-9.000.

Rapp, Howard: *See—*
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Reed, Terry J.: *See—*
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Regan, Michael T.; Reynolds, George A.; Specht, Donald P.; and Van Allan, James A., to Eastman Kodak Company. Pyrylium sensitizers for photoconductive compositions. 4,167,412, Cl. 96-1.600.

Reiter, Joseph. Trim fence. 4,167,079, Cl. 47-33.000.

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Arduini, Guido; Ghirga, Marcello; and Renda, Gaspare, 4,167,548, Cl. 264-12.000.

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Research Corporation: *See—*
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Ressler, Erhard O., to Kees Surgical Specialty Co. Machine for testing aneurysm clips. 4,167,112, Cl. 73-161.000.

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Ridley, Richard D., to Occidental Oil Shale, Inc. Method of forming an in situ oil shale retort with void volume as function of kerogen content of formation within retort site. 4,167,291, Cl. 299-2.000.

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Rogers, Billie O.: *See—*
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Rogozhin, Sergei V.; Vainerman, Efim S.; and Burmistrova, Ljubov M. Method for producing protein jellies from fishes and crustaceans. 4,167,590, Cl. 426-574.000.

Rohm and Haas Company: *See—*
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Lewis, Sheldon N.; and Miller, John J., 4,167,502, Cl. 260-29.60H.
Miller, George A.; and Lewis, Sheldon N., 4,167,575, Cl. 424-270.000.
Miller, George A.; and Chan, Hak-Foon, 4,167,576, Cl. 424-273.00R.

Rojey, Alexandre, to Institut Francais du Petrole. Absorption process for heat conversion. 4,167,101, Cl. 62-102.000.

Romero, Anibal; and Spector, George. Puck projecting game. 4,167,267, Cl. 273-95.00E.

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Rooks, Robert J., to Dow Corning Corporation. Process for preparing a textile-treating composition and resin-silicone compositions therefor. 4,167,501, Cl. 260-29.40R.

Rosaen, Borje O.; and Fosdick, Dale P. Fluid filtering device. 4,167,483, Cl. 210-130.000.

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Rosen, Arye: *See—*
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Roth, Helmut: *See—*
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Rothgordt, Ulf, to U.S. Philips Corporation. Method and device for transmitting facsimile picture signals. 4,167,758, Cl. 358-261.000.

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Rumpf, Robert J., to Firestone Tire & Rubber Company, The. Snap-in retractor. 4,167,277, Cl. 280-807.000.

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Ruppert, Heinrich W.; Gatschmann, Klaus; and Haller, Hans, to Efka-Werke Fritz Kiehn GmbH. Chute filling device for filter cigarette casings. 4,167,091, Cl. 53-149.000.

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Sakurada, Nobuaki; Shinoda, Nobuhiko; Ito, Tadashi; Mashimo, Yukio; and Ito, Fumio, to Canon Kabushiki Kaisha. Indication and photometric unit. 4,167,332, Cl. 356-227.000.

Sakurada, Nobuaki: *See—*
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Salete, Felipe. Universal modular screening, classifying, cleaning and sizing machine. 4,167,478, Cl. 209-331.000.

Salzgitter Maschinen Aktiengesellschaft: *See—*
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Sandoz Ltd.: *See—*
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Sandy Hill Corporation: *See—*
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Sanford, Arthur C. Knock-down truss structure. 4,167,090, Cl. 52-641.000.

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Sasaki, Reiichi: *See—*
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Sato, Masaru; and Saito, Takahiko, to Sony Corporation. Channel selecting apparatus. 4,167,704, Cl. 325-457.000.

Satoh, Ken; and Fukuoka, Norio, to Olympus Optical Co., Ltd. Tape recorder apparatus with a tape-running direction display. 4,167,787, Cl. 364-705.000.

Satou, Kazuo; and Ueno, Mitsuhiko, to Tokyo Shibaura Electric Co., Ltd. Complementary mosfet device and method of manufacturing the same. 4,167,747, Cl. 357-42.000.

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Sawyer, Philip N., to Interface Biomedical Laboratories Corp. Cardiac and vascular prostheses. 4,167,045, Cl. 3-1.400.

Sayles, David C., to United States of America, Army. Conductance method for determining the mechanical properties of propellants. 4,167,428, Cl. 149-109.600.

Scarr, Robert F., to Union Carbide Corporation. Zinc oxide additive for divalent silver oxide electrodes. 4,167,609, Cl. 429-206.000.

Schaaf, Theodore F., to Western Electric Company, Inc. Method of treating an electroplating solution comprising ions of gold and cyanide prior to electroplating and thermocompression bonding. 4,167,240, Cl. 228-196.000.

Schabert, Hans-Peter; and Strickroth, Erich, to Kraftwerk Union Aktiengesellschaft. Nuclear reactor installation in underground construction. 4,167,087, Cl. 52-169.600.

Schaffner, Ernst: *See*—
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Schmid, Horst: *See*—
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Schmidt, Gunther; Puschmann, Sigfrid; and Engelhardt, Gunther, to Boehringer Ingelheim GmbH. 2-Methyl-6-alkyl-11-aminoalkyl-6,11-dihydro-5H-pyrido(2,3-B)(1,5)benzodiazepin-5-ones and salts thereof. 4,167,570, Cl. 424-256.000.

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Schon, Adolf: *See*—
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Schouteten, Augustinus P. H.; and Den Otter, Marinus J.A.M., to Stamicarbon, B.V. Process for the preparation of cyanuric acid. 4,167,631, Cl. 544-192.000.

Schrader, Gustav E.; Scheucher, Karl; Cornyn, William S.; and Rea, Robert E., to TRW Inc. Electrode drive and controls for electrochemical machining. 4,167,462, Cl. 204-129.250.

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Schweiger, Fritz, to Hochtemperatur-Kernkraftwerk GmbH KG Gemeinsames Europaisches Unternehmen. Removal of impurities from the coolant gas of gas-cooled high temperature nuclear reactors. 4,167,444, Cl. 176-37.000.

Scranton Manufacturing: *See*—
Wright, Harold G.; and Silbaugh, Ronald D., 4,167,272, Cl. 280-163.000.

Sea-Log Corporation: *See*—
Gelbke, Arthur W., 4,167,304, Cl. 350-96.210.

SeaTek Corp.: *See*—
Bergman, Gunnar B., 4,167,147, Cl. 114-122.000.

Seaton: *See*—
Kubota, Yukio; and Seaton, 4,167,763, Cl. 360-77.000.

Seiden, William: *See*—
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Seiler, Erhard: *See*—
Fahrbach, Gerhard; Gerberding, Karl; Seiler, Erhard; and Stein, Dieter, 4,167,545, Cl. 525-122.000.

Seitz-Werke GmbH: *See*—
Tschersich, Erwin; Mergenthaler, Waldemar; Pamukcu, Ali; and Kaiser, Klaus, 4,167,203, Cl. 141-59.000.

Sekiya, Tetsuo; Uchida, Hiroyuki; Yamauchi, Hiroyuki; and Umeda, Kenkichi, to Sony Corporation. Brush-less DC motor. 4,167,692, Cl. 318-138.000.

Seko, Nachio: *See*—
Yano, Takashi; Tani, Tatsuo; Seko, Nachio; Idenawa, Hiroyuki; and Nakamura, Isao, 4,167,322, Cl. 355-3.00R.

Selhub, Jacob; Rachmilewitz, Bracha; and Grossowicz, Nathan, to Yissum Research Development Company of the Hebrew University of Jerusalem. Determination of transcobalamins. 4,167,556, Cl. 424-1.000.

Semba, Toru: *See*—
Yoshida, Morio; Asato, Ikuo; Semba, Toru; and Murase, Kiyoshi, 4,167,597, Cl. 427-407.00B.

Senba, Junichi. Programmable sequence control device simulating flow chart sequences. 4,167,788, Cl. 364-802.000.

Senor, Ronald E.; and Abcouwer, Jan A., to Texas Instruments Incorporated. Hermetic motor protector. 4,167,721, Cl. 337-112.000.

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Serlin, Irving, to Monsanto Company. Electrographic recording material. 4,167,602, Cl. 428-240.000.

Shackle, Peter W.: *See*—
D'Angelo, Robert S.; Hartman, Adrian R.; and Shackle, Peter W., 4,167,748, Cl. 357-46.000.

Shackleton, Raymond T., to Keighley Grinders (Machine Tools) Limited. Loading devices for form followers. 4,167,064, Cl. 33-23.00K.

Shapkin, Alexandr F.: *See*—
Timofeev, Alexandr V.; Batjukov, Vladimir I.; Fadeev, Alexandr I.; Shapkin, Alexandr F.; Shkhiyan, Tsolak G.; Ordynsky, Georgy V.; Drachev, Viktor P.; and Pogodin, Evgeny N., 4,167,442, Cl. 176-30.000.

Shaw, Herbert J.; Souquet, Jacques; and Fortunko, Christopher M., to United States of America, Navy. Surface acoustic wave bridge for rotation measurement. 4,167,120, Cl. 73-505.000.

Shell Development Company: *See*—
Van Mannekes, Abraham; Channon, Ross T.; and De Beukelaar, Jan W., 4,167,619, Cl. 528-483.000.

Shell Oil Company: *See*—
Street, Evan H., Jr., 4,167,214, Cl. 166-307.000.

Sherk, Fred T.: *See*—
Dick, James E.; Sherk, Fred T.; and Drehman, Lewis E., 4,167,472, Cl. 208-80.000.

Sherman, Robert S. Safety and security outlet. 4,167,658, Cl. 200-44.000.

Sheth, Prabhakar R.; and Tossounian, Jacques L., to Hoffmann-La Roche Inc. Novel sustained release tablet formulations. 4,167,558, Cl. 424-22.000.

Shichijo, Hajime, to Sony Corporation. Tuning apparatus. 4,167,702, Cl. 325-455.000.

Shick Incorporated: *See*—
Liedtke, Ronald R., 4,167,660, Cl. 200-155.00R.

Shilov, Vasily P.: *See*—
Brjukhov, Boris F.; Buchin, Nikolai B.; and Shilov, Vasily P., 4,167,119, Cl. 73-488.000.

Shimada, Keizo; Harada, Toshiaki; Koga, Masahiro; Nagahama, Shizuo; Minematsu, Hiroyoshi; and Yoshida, Hidetsugu, to Teijin Limited. Diazaphenalene derivatives and resin containing color compositions. 4,167,506, Cl. 260-37.00N.

Shimada, Kikuo: *See*—
Muraoka, Mamoru; Shimada, Kikuo; Komada, Hiroshi; and Gami, Toshiyuki, 4,167,151, Cl. 118-665.000.

Shimizu, Hidetoshi; Tamura, Hidemasa; and Makino, Yoshimi, to Sony Corporation. Dew-sensing hygroscopic element. 4,167,725, Cl. 338-35.000.

Shinoda, Nobuhiko; Sakurada, Nobuaki; Kawamura, Masaharu; Ito, Tadashi; Murakami, Hiroyashu; and Ito, Fumio, to Canon Kabushiki

Kaisha. Exposure control circuit for a camera. 4,167,312, Cl. 354-23.00D.
Shinoda, Nobuhiko: *See—*
Sakurada, Nobuaki; Shinoda, Nobuhiko; Ito, Tadashi; Mashimo, Yukio; and Ito, Fumio, 4,167,332, Cl. 356-227.000.
Shirai, Kiyoshi: *See—*
Maki, Toshio; Oki, Isao; and Shirai, Kiyoshi, 4,167,197, Cl. 137-271.000.
Shirane, Kyoichi: *See—*
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Shirato, Toru; Yoshida, Minoru; and Mizuguchi, Hideki, to Japan Steel Works, Ltd., The. Filter screen exchanging apparatus for plastic extruder. 4,167,384, Cl. 425-183.000.
Shkhiyan, Tsolak G.: *See—*
Timofeev, Alexandr V.; Batjukov, Vladimir I.; Fadeev, Alexandr I.; Shapkin, Alexandr F.; Shkhiyan, Tsolak G.; Ordynsky, Georgy V.; Drachev, Viktor P.; and Pogodin, Evgeny N., 4,167,442, Cl. 176-30.000.
Shneerov, Yakov A.: *See—*
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.
Shriver, James R. One man antenna tower. 4,167,740, Cl. 343-882.000.
Siefken, Mark W., to Minnesota Mining and Manufacturing Company. Rapidly curable siloxane composition. 4,167,617, Cl. 528-23.000.
Siegel, William A., to Fischer & Porter Company. Pressure sensing cell for force-balance transmitter. 4,167,122, Cl. 73-706.000.
Siemens Aktiengesellschaft: *See—*
Boden, Karl; Fremerey, Johan K.; Comsa, George; Gudden, Friedrich; Appelt, Gunther; Friedel, Rudolf; and Geldner, Ernst, 4,167,671, Cl. 250-406.000.
Braumann, Gundokar; and Schon, Adolf, 4,167,717, Cl. 335-202.000.
Cirkler, Werner; and Krueger, Hans, 4,167,307, Cl. 350-345.000.
Herbst, Heiner, 4,167,425, Cl. 148-1.500.
Liska, Manfred; Kuhnlein, Hans; Kogler, Georg; and Schalk, Karl, 4,167,693, Cl. 318-138.000.
Pfitzenmaier, Gerhard, 4,167,713, Cl. 333-212.000.
Stodberg, Lars; and Sjostrom, Hans, 4,167,675, Cl. 250-491.000.
SIGMA-TAU Industrie Farmaceutiche Riunite S.p.A.: *See—*
DeWitt, Paolo; and Ramacci, Maria T., 4,167,572, Cl. 424-266.000.
Sih, John C.: *See—*
Johnson, Roy A.; and Sih, John C., 4,167,624, Cl. 542-426.000.
Sikonia, John G., to UOP Inc. Multiple-stage catalytic reforming with gravity-flowing dissimilar catalyst particles. 4,167,473, Cl. 208-140.000.
Sikonia, John G., to UOP Inc. Multiple-stage catalytic reforming with gravity-flowing dissimilar catalyst particles. 4,167,474, Cl. 208-140.000.
Silbaugh, Ronald D.: *See—*
Wright, Harold G.; and Silbaugh, Ronald D., 4,167,272, Cl. 280-163.000.
Silevitch, Michael B.: *See—*
Graneau, Peter; Silevitch, Michael B.; and Ames, Elizabeth E., 4,167,370, Cl. 417-48.000.
Simmonds, Edwin, to Loewy Robertson Engineering Company Limited. Rolling mill stand. 4,167,107, Cl. 72-239.000.
Simons, Robert E., to International Business Machines Corporation. Thermal interface adapter for a conduction cooling module. 4,167,771, Cl. 361-386.000.
Simpson, David P., to Electricity Council, The. Boilers. 4,167,209, Cl. 165-1.000.
Singer Company, The: *See—*
Ljung, Bo H. G., 4,167,336, Cl. 356-350.000.
Sintokogio Ltd.: *See—*
Terada, Hideto; and Yosikawa, Masanori, 4,167,206, Cl. 164-7.000.
Sipple, Ralph E., to Sperry Rand Corporation. Invalid instruction code detector. 4,167,778, Cl. 364-200.000.
Sistrunk, Thomas O., to Ethyl Corporation. Flame resistant cotton/-polyester blend substrates. 4,167,603, Cl. 428-260.000.
Sivakov, Vladimir F.: *See—*
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.
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SKF Kugellagerfabriken GmbH: *See—*
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,167,220, Cl. 175-337.000.
Slade, Boyd E.: *See—*
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Sloan-Kettering Institute for Cancer Research: *See—*
Goldstein, Gideon, 4,167,557, Cl. 424-1.000.
Sloboda, Adolph E., to American Cyanamid Company. Compositions and method of use to treat arthritic disease with m-fluorobenzimidoylacetonitrile. 4,167,580, Cl. 424-304.000.
Smith, Don H.: *See—*
Fowler, Frank C.; and Smith, Don H., 4,167,521, Cl. 260-467.000.
Smith, Herman W., to Upjohn Company, The. Trans-4,5,13,14-tetradehydro-PGI$_1$ amides. 4,167,625, Cl. 542-430.000.
Smith, Jack R.; and Reed, Terry J., to Westinghouse Electric Corp. Combined cycle electric power plant and a gas turbine having an improved overspeed protection system. 4,167,096, Cl. 60-39.28R.
Smith, Leslie H., to Imperial Chemical Industries Limited. Alkanolamine derivatives and pharmaceutical compositions and uses thereof. 4,167,581, Cl. 424-304.000.
Smith, Thomas H. Pump and valve arrangement. 4,167,374, Cl. 417-318.000.
Smith, Vernon H.: *See—*
Christenson, Dempster S.; Gordon, Michael F.; Kistler, Roland D.; Kriegler, Frank J.; Lampert, Seymour R.; Marshall, Robert E.; McLaughlin, Rowland H.; and Smith, Vernon H., 4,167,729, Cl. 340-146.3AH.
Smith, William V., to Lectrolarm Custom Systems, Inc. Split image camera system. 4,167,756, Cl. 358-225.000.
Smiths Industries Limited: *See—*
Mann, George, 4,167,113, Cl. 73-178.00R.
Smoot, George W., to Motorola, Inc. Phase detector output stage for phase locked loop. 4,167,711, Cl. 331-17.000.
Snyder, Ralph E.; and Robinson, Philip R., to Allegheny Ludlum Industries, Inc. Method for annealing silicon steel. 4,167,426, Cl. 148-113.000.
Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Arduini, Guido; Ghirga, Marcello; and Renda, Gaspare, 4,167,548, Cl. 264-12.000.
Soderberg, Sten T., to Lidkopings Mekaniska Verkstads Aktiebolag. Grinding machine adapted for changing of grinding wheels on a grinding spindle. 4,167,083, Cl. 51-168.000.
Sohner, Gerhard; and Roth, Helmut, to Robert Bosch GmbH. Turn-off protected ignition system for internal combustion engines. 4,167,170, Cl. 123-148.00E.
Solar Energy Systems, Inc.: *See—*
Brussels, Nathan E., 4,167,178, Cl. 126-438.000.
Sonnenschein, Charles M.: *See—*
Jelalian, Albert V.; Sonnenschein, Charles M.; and Keene, Wayne H., 4,167,329, Cl. 356-5.000.
Sons, Mack D.; and Schlegel, William F. Spray control apparatus. 4,167,247, Cl. 239-455.000.
Sony Corporation: *See—*
Hanajima, Mitsuru; Tezuka, Masaru; and Matsumoto, Yasushi, 4,167,764, Cl. 360-90.000.
Hashizaki, Kazuo; and Shirane, Kyoichi, 4,167,762, Cl. 360-77.000.
Kono, Kenichiro; and Ogawa, Yoshio, 4,167,757, Cl. 358-254.000.
Kubota, Yukio; and Seaton, 4,167,763, Cl. 360-77.000.
Nagumo, Fumio; and Yamamoto, Kaichi, 4,167,754, Cl. 358-167.000.
Nagumo, Fumio, 4,167,755, Cl. 358-213.000.
Ohsawa, Mitsuo; Nakazawa, Hiroshi; and Yamagishi, Hiroshi, 4,167,649, Cl. 179-1.0GE.
Sato, Masaru; and Saito, Takahiko, 4,167,704, Cl. 325-457.000.
Sekiya, Tetsuo; Uchida, Hiroyuki; Yamauchi, Hiroyuki; and Umeda, Kenkichi, 4,167,692, Cl. 318-138.000.
Shichijo, Hajime, 4,167,702, Cl. 325-455.000.
Shimizu, Hidetoshi; Tamura, Hidemasa; and Makino, Yoshimi, 4,167,725, Cl. 338-35.000.
Suwa, Hisashi; and Haneishi, Kohei, 4,167,703, Cl. 325-455.000.
Suzuki, Tadao; and Yoshida, Tadao, 4,167,710, Cl. 330-298.000.
Tachi, Katsuichi, 4,167,759, Cl. 360-14.000.
Sorensen, Frode; Pedersen, Hans K.; Jorgen, Hyldal; and Strandtoft, Benny, to Danfoss A/S. Control arrangement for a brushless motor. 4,167,691, Cl. 318-138.000.
Sorenson, Paul D.; and McNichols, Larry A., to Medtronic, Inc. Pulse dosage control unit for tissue stimulation system. 4,167,190, Cl. 128-423.00R.
Sosnay, Alan J. Orthodontic threading tool. 4,167,063, Cl. 32-66.000.
Souquet, Jacques: *See—*
Shaw, Herbert J.; Souquet, Jacques; and Fortunko, Christopher M., 4,167,120, Cl. 73-505.000.
Spaziante, Placido M.: *See—*
de Nora, Vittorio; and Spaziante, Placido M., 4,167,607, Cl. 429-15.000.
Specht, Donald P.: *See—*
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Spector, George: *See—*
Alaniz, Matt; and Spector, George, 4,167,065, Cl. 33-137.00R.
Romero, Anibal; and Spector, George, 4,167,267, Cl. 273-95.00E.
Spencer, Donald B., to Mason Fence Company, The. Gate latch. 4,167,281, Cl. 292-216.000.
Sperry Rand Corporation: *See—*
Best, Donald T., 4,167,761, Cl. 360-45.000.
Dendy, Joe B., 4,167,296, Cl. 308-10.000.
Sipple, Ralph E., 4,167,778, Cl. 364-200.000.
Sprague, Dennis R.: *See—*
Christ, Allen E.; Sprague, Dennis R.; and Ziegner, Bernhard A., 4,167,413, Cl. 96-36.200.
Spuck, William H., III, to United States of America, National Aeronautics & Space Administration. Borehole geological assessment. 4,167,111, Cl. 73-155.000.

Square D Company: *See*—
Baker, Andrew P.; and Carpenter, Peter E. G., 4,167,768, Cl. 361-355.000.

Stahlherm, Dieter: *See*—
Knappstein, Johannes; Thiersch, Friedrich; Schuch, Werner; Weber, Rolf; Beck, Kurt-Gunther; and Stahlherm, Dieter, 4,167,453, Cl. 202-141.000.

Stahlhuth, Paul H.: *See*—
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Stamicarbon, B.V.: *See*—
Schouteten, Augustinus P. H.; and Den Otter, Marinus J.A.M., 4,167,631, Cl. 544-192.000.

Standard Oil Company: *See*—
Grant, Stephen L., 4,167,397, Cl. 44-1.00R.
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 4,167,494, Cl. 252-432.000.

Standard Oil Company (Indiana): *See*—
Akin, Cavit; and Darrington, Franklin D., 4,167,591, Cl. 426-656.000.
Bertolacini, Ralph J.; Kim, Dae K.; and Lehmann, Gerald M., 4,167,530, Cl. 585-475.000.
Chen, Yu-Tsai, 4,167,620, Cl. 528-481.000.
Lucksinger, James E., 4,167,279, Cl. 285-144.000.
Stoltz, Richard A.; and Metrailer, Albert C., 4,167,213, Cl. 166-251.000.

Stanley, William L.: *See*—
Masri, Merle S.; Randall, Virginia G.; and Stanley, William L., 4,167,447, Cl. 435-178.000.

Stark, Karl-Heinz: *See*—
Fenner, Hans; Auwarter, Wilhelm; and Stark, Karl-Heinz, 4,167,285, Cl. 296-178.000.

Stark, Thomas M., to Exxon Nuclear Company, Inc. Gas-centrifuge unit and centrifugal process for isotope separation. 4,167,244, Cl. 233-18.000.

Stedefeder, Joachim: *See*—
Schenk, Wolfgang; Stedefeder, Joachim; Leitner, Heinz; and Schenck, Hans-Uwe, 4,167,485, Cl. 252-8.600.

Steen, William M., to National Research Development Corporation. Methods and apparatus for cutting and welding. 4,167,662, Cl. 219-121.00L.

Stein, Dieter: *See*—
Fahrbach, Gerhard; Gerberding, Karl; Seiler, Erhard; and Stein, Dieter, 4,167,545, Cl. 525-122.000.

Stein, Herman H.; Prasad, Raj N.; Tietje, Karin R.; and Fung, Anthony K. L., to Abbott Laboratories. Adenosine-5'-carboxamides and method of use. 4,167,565, Cl. 424-180.000.

Sternberg, Stanley R., to Environmental Research Institute of Michigan. Automatic image processor. 4,167,728, Cl. 340-146.3MA.

Stewart-Warner Corporation: *See*—
Baker, John D., 4,167,699, Cl. 324-171.000.

Stievenart, Emile F.; Plessers, Hendrik S.; and Neujens, Georges J., to AGFA-GEVAERT N.V. Sheet squaring device. 4,167,673, Cl. 250-468.000.

Stirling-White Company, Inc.: *See*—
Burek, Michael J.; and White, Robert S., 4,167,688, Cl. 315-178.000.

Stodberg, Lars; and Sjostrom, Hans, to Siemens Aktiengesellschaft. X-ray collimator comprising light beam localizer with lens system. 4,167,675, Cl. 250-491.000.

Stoever, Juergen, to Fischer & Porter Company. Oscillating-ball flowmeter. 4,167,115, Cl. 73-194.00E.

Stokley, Charles O.; Muecke, Thomas W.; Gruesbeck, Clay, Jr.; and Salathiel, William M., to Exxon Production Research Company. Apparatus and method for sampling flowing fluids and slurries. 4,167,117, Cl. 73-422.00R.

Stoltz, Richard A.; and Metrailer, Albert C., to Standard Oil Company (Indiana). Method for determining the position and inclination of a flame front during in situ combustion of a rubbled oil shale retort. 4,167,213, Cl. 166-251.000.

Storm, Herbert F., to General Electric Company. Radiation triggered thyristor with light focussing guide. 4,167,746, Cl. 357-30.000.

Strandtoft, Benny: *See*—
Sorensen, Frode; Pedersen, Hans K.; Jorgen, Hyldal; and Strandtoft, Benny, 4,167,691, Cl. 318-138.000.

Strausak, Benedikt: *See*—
Knuchel, Paul; Strausak, Benedikt; Laeng, Rudolf; and Vavrina, Josef, 4,167,774, Cl. 362-87.000.

Street, Evan H., Jr., to Shell Oil Company. Process for stably sequestering iron while acidizing a reservoir. 4,167,214, Cl. 166-307.000.

Strickroth, Erich: *See*—
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Strojni a traktorova stanice v Zatci, narodni podnik Zatec Corporation: *See*—
Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, 4,167,123, Cl. 74-125.500.

Stuben, Werner; and Zeuschner, Ulrich, to Wilhelm Fette GmbH. Apparatus for the manufacture of layered articles such as multilayer tablets. 4,167,380, Cl. 425-134.000.

Stuteville, Douglas W.: *See*—
Noyes, Richard C.; Zaman, Shakir U.; and Stuteville, Douglas W., 4,167,443, Cl. 176-36.00R.

Suchkova, Maria D.: *See*—
Korshak, Vasily V.; Polyakova, Antonina M.; Suchkova, Maria D.; and Mager, Kira A., 4,167,546, Cl. 525-275.000.

Suda, Masao: *See*—
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Sugai, Haruo: *See*—
Yamamura, Yukio; Hamabe, Takafumi; and Sugai, Haruo, 4,167,182, Cl. 128-56.000.

Sugino, Eiji: *See*—
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Sullivan, Daniel T.; Kaman, Charles H.; O'Loughlin, James F.; and Kapadia, Jamshed R., to Digital Equipment Corporation. Diagnostic apparatus in a data processing system. 4,167,779, Cl. 364-200.000.

Sulzer Brothers Limited: *See*—
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Sumitomo Chemical Company, Limited: *See*—
Fujita, Fumio; Fukami, Kosuke; and Fujimoto, Masanori, 4,167,623, Cl. 536-120.000.
Kataoka, Yushin; Itoh, Shojiro; and Niwano, Masahiro, 4,167,525, Cl. 260-544.00D.

Sumitomo Electric Industries Ltd.: *See*—
Ichiba, Terumichi; Kawaguchi, Munetaka; and Yamamoto, Yutaka, 4,167,305, Cl. 350-96.340.

Sumitomo Heavy Industries, Ltd.: *See*—
Muraoka, Mamoru; Shimada, Kikuo; Komada, Hiroshi; and Gami, Toshiyuki, 4,167,151, Cl. 118-665.000.

Sun Oil Company of Pennsylvania: *See*—
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Sundstrand Data Control, Inc.: *See*—
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Suresh, Dev D.: *See*—
Grasselli, Robert K.; Suresh, Dev D.; and Miller, Arthur F., 4,167,494, Cl. 252-432.000.

Suwa, Hisashi; and Haneishi, Kohei, to Sony Corporation. Tuning apparatus with band-selection means. 4,167,703, Cl. 325-455.000.

Suzki, Akiyoshi, to Canon Kabushiki Kaisha. Optical device for the alignment of two superimposed objects. 4,167,677, Cl. 356-401.000.

Suzuki, Tadao; and Yoshida, Tadao, to Sony Corporation. Pulse width modulated signal amplifier with protective means. 4,167,710, Cl. 330-298.000.

Suzuki, Toshio: *See*—
Okazaki, Hiroshi; Suzuki, Toshio; Kondo, Takeo; and Hiraiwa, Nobuo, 4,167,294, Cl. 301-108.00R.

Svenska Kassaregister AB: *See*—
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Svenska Kram AB: *See*—
Hansson, Erik G., 4,167,355, Cl. 403-374.000.

Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M. Protective coating for metal ingot molds and cores. 4,167,418, Cl. 106-38.280.

Swanlund, Steve, to Kroger Company, The. Cheese wrapping and stacking machine. 4,167,364, Cl. 414-46.000.

Swanson, Guy J.: *See*—
Logan, James D.; and Swanson, Guy J., 4,167,734, Cl. 340-682.000.

Swiatowiecz, Frank J.: *See*—
Anderson, Jack L.; Swiatowiecz, Frank J.; and Glazer, Marvin A., 4,167,727, Cl. 340-146.1AG.

Swiss Aluminium Ltd.: *See*—
Anthony, William H.; Popplewell, James M.; and Brock, Andrew J., 4,167,410, Cl. 75-138.000.
Hrasche, Heinrich, 4,167,273, Cl. 280-179.00R.

Swissmechanic, Sektion Schwyz: *See*—
Wirth, Ernst, 4,167,146, Cl. 110-251.000.

Sybron Corporation: *See*—
Freedman, Frank J.; and Fishbaugh, Warren D., 4,167,382, Cl. 425-256.000.

Synek, Jan: *See*—
Hestad, Alfred M.; and Synek, Jan, 4,167,655, Cl. 179-90.00K.

Szala, Laurence E.: *See*—
Lee, Minyoung; Szala, Laurence E.; and DeVries, Robert C., 4,167,399, Cl. 51-307.000.

Tabicman, Benjamin; and Rapp, Howard. Indoor golf driving range. 4,167,266, Cl. 273-35.00B.

Tachi, Katsuichi, to Sony Corporation. Apparatus for inserting an address signal in a frame of the vertical blanking period of a television signal. 4,167,759, Cl. 360-14.000.

Tachi, Susumu; and Tanie, Kazuo, to Agency of Industrial Science & Technology. Apparatus for transmission of information by electrocutaneous stimulus. 4,167,189, Cl. 128-421.000.

Tackett, Louis E., to Unep 3 Energy Systems, Inc. Integrated energy system. 4,167,372, Cl. 417-62.000.

Takahashi, Masamitsu. Needle case. 4,167,231, Cl. 206-382.000.

Takahashi, Noboru; Ozaki, Sadao; Naruse, Tunehide; Isono, Hiromasa; and Nishihara, Toshikazu, to Victor Company of Japan, Limited. Magnetic metallic powder containing iron and magnetic recording medium using same powder. 4,167,582, Cl. 428-328.000.

Takamaru, Takeshi; and Nakagawa, Tohru, to Hitachi, Ltd. Air valve type carburetor. 4,167,547, Cl. 261-44.00C.

Takano, Satoshi: *See*—
Yamanaka, Makoto; Mikata, Tsuruo; Takano, Satoshi; Okamoto, Kikuhiko; and Saito, Fumio, 4,167,518, Cl. 260-397.250.

Takanohashi, Hiromitsu: *See*—
Taniyama, Susumu; Takanohashi, Hiromitsu; and Inoue, Shoichi, 4,167,537, Cl. 525-443.000.

Takeda Chemical Industries, Ltd.: *See*—
Mikura, Yasushi; Matukura, Yoshiharu; and Fujisawa, Hiroshi, 4,167,563, Cl. 424-177.000.

Takeda, Yorimasa: *See*—
Ueda, Shoji; Daikoku, Takashi; Takeda, Yorimasa; Hiromoto, Akira; Nagai, Nobuyuki; Moriguchi, Yasuo; and Ito, Yoshimasa, 4,167,427, Cl. 148-133.000.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; and Hamada, Masa, 4,167,448, Cl. 435-70.000.

Tamura, Hidemasa: *See*—
Shimizu, Hidetoshi; Tamura, Hidemasa; and Makino, Yoshimi, 4,167,725, Cl. 338-35.000.

Tamura, Noriyoshi; and Kihara, Kunio, to Mitsubishi Petrochemical Company Limited. Process for the production of an ion exchange membrane. 4,167,551, Cl. 521-27.000.

Tang, Darl L., to Dynasty Design, Inc. Point-of-sale display marker assembly. 4,167,073, Cl. 40-124.100.

Tani, Tatsuo: *See*—
Yano, Takashi; Tani, Tatsuo; Seko, Nachio; Idenawa, Hiroyuki; and Nakamura, Isao, 4,167,322, Cl. 355-3.00R.

Tanie, Kazuo: *See*—
Tachi, Susumu; and Tanie, Kazuo, 4,167,189, Cl. 128-421.000.

Taniguchi, Itsuki; Itoh, Ryuichi; Iwatsuki, Toshihiro; and Ohuchi, Shigehiro, to Toray Industries, Inc.; and Sanyo Chemical Industries, Inc. Resinous composition for surface-treating reinforcing fibers and surface-treating process. 4,167,538, Cl. 525-438.000.

Taniyama, Susumu; Takanohashi, Hiromitsu; and Inoue, Shoichi, to Mitsubishi Gas Chemical Company, Inc. Surface-treating coating composition for plastic articles. 4,167,537, Cl. 525-443.000.

Tarantino, Phillip. Hand rake with cutting edge. 4,167,217, Cl. 172-375.000.

Tatsumi, Hiroyuki: *See*—
Kuki, Takakuni; and Tatsumi, Hiroyuki, 4,167,701, Cl. 325-41.000.

Taubenmann, Peter, to Krauss-Maffei. Apparatus for the feeding of liquid synthetic resin components. 4,167,236, Cl. 222-135.000.

Teijin Limited: *See*—
Shimada, Keizo; Harada, Toshiaki; Koga, Masahiro; Nagahama, Shizuo; Minematsu, Hiroyoshi; and Yoshida, Hidetsugu, 4,167,506, Cl. 260-37.00N.

Tekken Construction Co. Ltd.: *See*—
Yamazaki, Hironobu; Sugino, Eiji; and Yuchida, Yoshiaki, 4,167,290, Cl. 299-1.000.

Telefonaktiebolaget L M Ericsson: *See*—
Braugenhardt, Anders E. S.; Hedin, Nils A.; Odhelius, Gustaf H. V.; and Anas, Johan O., 4,167,652, Cl. 179-15.0AT.

Templeton, Larry F.: *See*—
Orr, F. Donald, Jr.; Templeton, Larry F.; and Keutzer, Larry L., 4,167,466, Cl. 204-176.000.

Terada, Hideto; and Yosikawa, Masanori, to Sintokogio Ltd. Method for forming vacuum-sealed mould. 4,167,206, Cl. 164-7.000.

Tessler, Martin M., to National Starch and Chemical Corporation. Method for preparing starch ether derivatives. 4,167,621, Cl. 536-108.000.

Testa, Dominick. Applicator for liquid coating compositions. 4,167,349, Cl. 401-144.000.

Texaco Development Corp.: *See*—
Waddill, Harold G., 4,167,498, Cl. 260-18.0PN.

Texaco Inc.: *See*—
Sequeira, Avilino, Jr.; and Barger, Frank L., 4,167,451, Cl. 196-14.520.
Sequeira, Avilino, Jr.; and Barger, Frank L., 4,167,452, Cl. 196-14.520.

Texas Instruments Incorporated: *See*—
Senor, Ronald E.; and Abcouwer, Jan A., 4,167,721, Cl. 337-112.000.

Texas Vet Lab, Inc.: *See*—
Wohler, Wilson H., Jr., 4,167,560, Cl. 424-92.000.

Textron Inc.: *See*—
Molnar, Frank J., 4,167,055, Cl. 24-205.16C.

Tezuka, Masaru: *See*—
Hanajima, Mitsuru; Tezuka, Masaru; and Matsumoto, Yasushi, 4,167,764, Cl. 360-90.000.

Theard, Leslie P.: *See*—
Heilman, William J.; Peterson, Frank C.; Renz, Mical C.; and Theard, Leslie P., 4,167,539, Cl. 525-117.000.

Theiling, Louis F., Jr.: *See*—
Cowherd, Frank G., III; and Theiling, Louis F., Jr., 4,167,635, Cl. 544-388.000.

Thekdi, Arvind C., to Midland-Ross Corporation. Device for preheating air used in combustion. 4,167,212, Cl. 165-134.00R.

Thiersch, Friedrich: *See*—
Knappstein, Johannes; Thiersch, Friedrich; Schuch, Werner; Weber, Rolf; Beck, Kurt-Gunther; and Stahlherm, Dieter, 4,167,453, Cl. 202-141.000.

Thomas Broadbent & Sons Limited: *See*—
Jackson, Joseph F., 4,167,243, Cl. 233-7.000.

Thomas, Wolfram: *See*—
Grundei, Hans; Henssage, Joachim; Thomas, Wolfram; and Schutt, Gerhard, 4,167,047, Cl. 3-1.911.

Thomson-CSF: *See*—
Mourier, Georges, 4,167,668, Cl. 250-291.000.

Thorne, Paul M., to FMC Corporation. Guidelineless subsea wellhead entry/reentry system. 4,167,215, Cl. 166-341.000.

Thyssen Industrie Aktiengesellschaft: *See*—
Bitterberg, Friedhelm, 4,167,143, Cl. 105-164.000.

Tietje, Karin R.: *See*—
Stein, Herman H.; Prasad, Raj N.; Tietje, Karin R.; and Fung, Anthony K. L., 4,167,565, Cl. 424-180.000.

Timofeev, Alexandr V.; Batjukov, Vladimir I.; Fadeev, Alexandr I.; Shapkin, Alexandr F.; Shkhiyan, Tsolak G.; Ordynsky, Georgy V.; Drachev, Viktor P.; and Pogodin, Evgeny N. System for recharging fuel assemblies of nuclear reactor. 4,167,442, Cl. 176-30.000.

Toa Paint Company, Ltd.: *See*—
Yoshida, Morio; Asato, Ikuo; Semba, Toru; and Murase, Kiyoshi, 4,167,597, Cl. 427-407.00B.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Karasawa, Yukinori, 4,167,302, Cl. 350-36.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Ishibashi, Masayuki; and Morita, Tuneo, 4,167,745, Cl. 357-23.000.
Satou, Kazuo; and Ueno, Mitsuhiko, 4,167,747, Cl. 357-42.000.

Tomadini, Gino. Transport system with swinging or vibrating belts for the drying of long pasta. 4,167,068, Cl. 34-164.000.

Tomaszewski, Thaddeus W., to Oxy Metal Industries Corporation. Trivalent chromium plating bath composition and process. 4,167,460, Cl. 204-51.000.

Tomimoto, Tetsuo; Nagaoka, Yoshitomi; and Sasaki, Reiichi, to Matsushita Electric Industrial Co., Ltd. Color-difference signal modifying apparatus. 4,167,750, Cl. 358-27.000.

Tomlinson, Hugh F. D., to Elektroflo Systems Limited. Fluid flow measurement. 4,167,736, Cl. 343-5.0NA.

Toray Industries, Inc.: *See*—
Taniguchi, Itsuki; Itoh, Ryuichi; Iwatsuki, Toshihiro; and Ohuchi, Shigehiro, 4,167,538, Cl. 525-438.000.

Toro Company, The: *See*—
Edmonson, Orvan D.; and Wood, William D., 4,167,221, Cl. 180-19.00H.

Tossounian, Jacques L.: *See*—
Sheth, Prabhakar R.; and Tossounian, Jacques L., 4,167,558, Cl. 424-22.000.

Toth, Gyorgy: *See*—
Bognar, Rezso; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,167,636, Cl. 546-46.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Fukuda, Daiki, 4,167,095, Cl. 60-39.030.
Kondo, Toshio; Ito, Nobuyuki; Norimatsu, Hideaki; and Kobayashi, Nobuyuki, 4,167,396, Cl. 123-32.0EE.
Okazaki, Hiroshi; Suzuki, Toshio; Kondo, Takeo; and Hiraiwa, Nobuo, 4,167,294, Cl. 301-108.00R.
Yamada, Makoto; and Kinaga, Eiichi, 4,167,054, Cl. 24-171.000.

Trac Incorporated: *See*—
McReynolds, Marshall B.; and Van Tilbury, Jack D., 4,167,784, Cl. 364-436.000.
McReynolds, Marshall B.; Van Tilbury, Jack D.; and Oscar, Irving S., 4,167,785, Cl. 364-437.000.

Trama, Rudolfo: *See*—
Heine, Juan; Trama, Rudolfo; and Penedo, Eduardo, 4,167,586, Cl. 426-250.000.

Traynor, Craig D. Device to facilitate the removal of housed or blocked bearing assemblies. 4,167,057, Cl. 29-283.000.

Trisa Burstenfabrik AG Triengen: *See*—
Arnold, Franz, 4,167,192, Cl. 132-9.000.

Trittipoe, Jack H., to Caterpillar Tractor Co. Scraper pull-hook assembly. 4,167,274, Cl. 280-481.000.

Trumbull Corporation: *See*—
Dick, Perry J., Jr., 4,167,360, Cl. 405-271.000.

TRW Inc.: *See*—
Schrader, Gustav E.; Scheucher, Karl; Cornyn, William S.; and Rea, Robert E., 4,167,462, Cl. 204-129.250.

Tschersich, Erwin; Mergenthaler, Waldemar; Pamukcu, Ali; and Kaiser, Klaus, to Seitz-Werke GmbH. Device for filling liquids into bottles and similar vessels. 4,167,203, Cl. 141-59.000.

Tsujimura, Akira: *See*—
Horiuchi, Tatsuya; Nawa, Michio; Tsujimura, Akira; Kubota, Mitsuru; Osada, Tomoaki; Manabe, Seiji; and Iwasawa, Hiromu, 4,167,218, Cl. 173-163.000.

Tsunefuji, Katsuhiko, to Olympus Optical Co., Ltd. Focal plane shutter camera having an electromagnetic diaphragm mechanism. 4,167,313, Cl. 354-31.000.

Tucker, Richard B. C.; Fracalossi, Roland N.; and Wajer, Mark T., to Wm. T. Burnett & Co., Inc. Flexible polyurethane foams having low resistance to air flow and method for preparation. 4,167,612, Cl. 521-110.000.

Tull, Roger J.; and Melillo, David G., to Merck & Co., Inc. 5-Fluoro-2-methyl-ind-1-ene-3-acetic acid. 4,167,640, Cl. 562-405.000.

Tupitsa, Vladimir I.: *See*—
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.

U-Brand Corporation: *See*—
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Uchida, Hiroyuki: *See—*
Sekiya, Tetsuo; Uchida, Hiroyuki; Yamauchi, Hiroyuki; and Umeda, Kenkichi, 4,167,692, Cl. 318-138.000.
Ueda, Shoji; Daikoku, Takashi; Takeda, Yorimasa; Hiromoto, Akira; Nagai, Nobuyuki; Moriguchi, Yasuo; and Ito, Yoshimasa, to Mitsubishi Jukogyo Kabushiki Kaisha; and Kobe Steel, Ltd. Heat treatment of titanium alloys. 4,167,427, Cl. 148-133.000.
Ueno, Mitsuhiko: *See—*
Satou, Kazuo; and Ueno, Mitsuhiko, 4,167,747, Cl. 357-42.000.
Ulam, John B., to Clad Metals, Inc. Multiple member clad metal products. 4,167,606, Cl. 428-653.000.
Umeda, Kenkichi: *See—*
Sekiya, Tetsuo; Uchida, Hiroyuki; Yamauchi, Hiroyuki; and Umeda, Kenkichi, 4,167,692, Cl. 318-138.000.
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; and Hamada, Masa, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Process for preparation of physiologically active peptides. 4,167,448, Cl. 435-70.000.
Unarco Industries, Inc.: *See—*
Martin, Leslie W.; and LeBeau, Richard A., 4,167,144, Cl. 105-467.000.
Unep 3 Energy Systems, Inc.: *See—*
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Union Camp Corporation: *See—*
Habas, Walter F.; and Elliott, Laurence E., 4,167,131, Cl. 83-304.000.
Union Carbide Corporation: *See—*
Cowherd, Frank G., III; and Theiling, Louis F., Jr., 4,167,635, Cl. 544-388.000.
Davis, James S., 4,167,402, Cl. 62-28.000.
Downing, James H.; and Merkert, Rodney F., 4,167,409, Cl. 75-129.000.
Louzos, Demetrios V.; and Brodd, Ralph J., 4,167,458, Cl. 204-14.00N.
Scarr, Robert F., 4,167,609, Cl. 429-206.000.
Williams, Thomas C., 4,167,423, Cl. 106-306.000.
Unitec, Inc.: *See—*
Furney, Douglas E., 4,167,687, Cl. 313-54.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Finlay, Ian C.; and Gallacher, George R., 4,167,165, Cl. 123-122.0AA.
United Networks Inc.: *See—*
Hestad, Alfred M.; and Synek, Jan, 4,167,655, Cl. 179-90.00K.
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Agriculture: *See—*
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Army: *See—*
Chen, Eugene H.; Saggiomo, Andrew J.; and Nodiff, Edward A., 4,167,638, Cl. 546-171.000.
Conrad, Raymond W., 4,167,463, Cl. 204-157.10R.
Miller, Thomas G.; Rogers, Billie O.; and Roberts, Thomas G., 4,167,666, Cl. 250-216.000.
Sayles, David C., 4,167,428, Cl. 149-109.600.
Health, Education and Welfare: *See—*
Morrow, Thomas J., 4,167,633, Cl. 544-323.000.
Interior: *See—*
Gomes, John M.; O'Keefe, Daniel A.; and Raddatz, Andrea E., 4,167,555, Cl. 423-53.000.
Lee, Agnes Y.; Falke, Wilbert L.; and Schwaneke, Alfred E., 4,167,459, Cl. 204-44.000.
Valdez, Espiridion G.; and Wilson, Wayne J., 4,167,477, Cl. 209-166.000.
National Aeronautics & Space Administration: *See—*
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Navy: *See—*
Esterowitz, Leon; Bartoli, Filbert J.; Allen, Roger E.; Goldberg, Lawrence S.; Nicolai, Van O.; Kruer, Melvin R.; Linz, Arthur; and Jenssen, Hans P., 4,167,712, Cl. 331-94.50F.
Lewis, Bernard L., 4,167,735, Cl. 343-5.0LS.
Mauch, John W., 4,167,121, Cl. 73-640.000.
Shaw, Herbert J.; Souquet, Jacques; and Fortunko, Christopher M., 4,167,120, Cl. 73-505.000.
U.S. Philips Corporation: *See—*
Eggermont, Ludwig D. J., 4,167,731, Cl. 340-347.0DD.
Rothgordt, Ulf, 4,167,758, Cl. 358-261.000.
United Technologies Corporation: *See—*
Keelor, John R.; and Williams, James L., 4,167,388, Cl. 425-387.100.
University of New Hampshire: *See—*
Chesbro, William R.; Eifert, Robin; and Evans, Thomas, 4,167,450, Cl. 435-3.000.
University of Science of Malaysia: *See—*
Hock, Ong S.; and Cheng, Chuah C., 4,167,519, Cl. 260-428.500.
University of Sydney: *See—*
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UOP Inc.: *See—*
Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., 4,167,496, Cl. 252-466.00B.
Carson, Don B., 4,167,535, Cl. 585-717.000.
Hayes, John C., 4,167,495, Cl. 252-441.000.
Persico, Paul J.; Millar, Robert F.; and Jensen, Robert H., 4,167,553, Cl. 422-216.000.
Raymond, Robert F., 4,167,533, Cl. 585-251.000.
Sikonia, John G., 4,167,473, Cl. 208-140.000.
Sikonia, John G., 4,167,474, Cl. 208-140.000.
Varady, Victor A., 4,167,492, Cl. 252-417.000.
Winter, George R., III; and Anderson, Mark C., 4,167,475, Cl. 208-355.000.
Upjohn Company, The: *See—*
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McCall, John M., 4,167,567, Cl. 424-250.000.
Smith, Herman W., 4,167,625, Cl. 542-430.000.
Uriarte, Anthony K.; and Vaughan, James H., to Monsanto Company. Process for the production of tetrabromoethylene. 4,167,528, Cl. 260-654.00A.
Vainerman, Efim S.: *See—*
Rogozhin, Sergei V.; Vainerman, Efim S.; and Burmistrova, Ljubov M., 4,167,590, Cl. 426-574.000.
Valdez, Espiridion G.; and Wilson, Wayne J., to United States of America, Interior. Separation of plastics by flotation. 4,167,477, Cl. 209-166.000.
Van Allan, James A.: *See—*
Regan, Michael T.; Reynolds, George A.; Specht, Donald P.; and Van Allan, James A., 4,167,412, Cl. 96-1.600.
Van Mannekes, Abraham; Channon, Ross T.; and De Beukelaar, Jan W., to Shell Development Company. Purification of propylene polymerization product. 4,167,619, Cl. 528-483.000.
Van Mechelen, Bernard. Impact turbine. 4,167,367, Cl. 415-92.000.
van Remmen, Hendrikus H. J., to Instituut Voor Bewaring en Verwerking Van Landouwprodukten. Method and apparatus for frying thin potato slices to chips. 4,167,137, Cl. 99-352.000.
Van Sickle, John: *See—*
Franklin, Jim M.; Reed, Gary J.; and Van Sickle, John, 4,167,287, Cl. 296-97.00C.
Van Tilbury, Jack D.: *See—*
McReynolds, Marshall B.; and Van Tilbury, Jack D., 4,167,784, Cl. 364-436.000.
McReynolds, Marshall B.; Van Tilbury, Jack D.; and Oscar, Irving S., 4,167,785, Cl. 364-437.000.
Varady, Victor A., to UOP Inc. Spent-catalyst combustion regeneration process with recycle of hot regenerated catalyst and spent catalyst. 4,167,492, Cl. 252-417.000.
Varner, William L.; and Willis, Billy R., to Mileage Research, Ltd. Hot air vaporization system for an internal combustion engine. 4,167,166, Cl. 123-122.00D.
Vaughan, James H.: *See—*
Uriarte, Anthony K.; and Vaughan, James H., 4,167,528, Cl. 260-654.00A.
Vavrina, Josef: *See—*
Knuchel, Paul; Strausak, Benedikt; Laeng, Rudolf; and Vavrina, Josef, 4,167,774, Cl. 362-87.000.
Vawter, John G.: *See—*
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VEB Jenapharm: *See—*
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Velsicol Chemical Corporation: *See—*
Krenzer, John, 4,167,407, Cl. 71-90.000.
Verdol S.A.: *See—*
Verdollin, Jacques, 4,167,094, Cl. 57-58.720.
Verdollin, Jacques, to Verdol S.A. Spindles for twisting machines. 4,167,094, Cl. 57-58.720.
Vereinigte Baubeschlagfabriken Gietsch & Co. GmbH: *See—*
Weiss, Klaus; and Luithlen, Heinz, 4,167,275, Cl. 280-605.000.
Vickers, Robert V.: *See—*
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Victor Company of Japan, Limited: *See—*
Takahashi, Noboru; Ozaki, Sadao; Naruse, Tunehide; Isono, Hiromasa; and Nishihara, Toshikazu, 4,167,582, Cl. 428-328.000.
Vinals, Joaquin F.: *See—*
Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,167,497, Cl. 252-522.000.
Vitzthum, Otto; and Hubert, Peter. Method for the manufacture of caffeine free black tea. 4,167,589, Cl. 426-312.000.
Vlaeminck, Roger A.: *See—*
Nuyts, Walter L. M. C.; and Vlaeminck, Roger A., 4,167,790, Cl. 365-15.000.
Volat, Jean-Pierre: *See—*
Pichon, Jean-Louis; Lousteau, Desire; and Volat, Jean-Pierre, 4,167,227, Cl. 198-456.000.
Vyzkumny ustav lykovych vlaken Sumperk: *See—*
Jakl, Vladimir; Cink, Josef; and Bacovsky, Filip, 4,167,123, Cl. 74-125.500.
Waddill, Harold G., to Texaco Development Corp. Water-based epoxy resin coating composition. 4,167,498, Cl. 260-18.0PN.
Wade, Jerry D.; and Geisler, Phillip H. Automatic animal headgate with bottom hinged gates. 4,167,155, Cl. 119-98.000.
Wahl, Edward F., III; and Boucher, Frederic B., to Occidental Petroleum Corporation. Countercurrent direct contact heat exchange process and system. 4,167,099, Cl. 60-641.000.
Wajer, Mark T.: *See—*
Tucker, Richard B. C.; Fracalossi, Roland N.; and Wajer, Mark T., 4,167,612, Cl. 521-110.000.
Walker, Brooks. Elongated multipart structural member. 4,167,354, Cl. 403-291.000.

Walker, Darrel W.; Hogan, Robert J.; and Farha, Floyd, Jr., to Phillips Petroleum Co. Dehydrogenation of organic compounds. 4,167,532, Cl. 585-622.000.
Walter, Lothar: *See*—
Ernst, Horst M.; Olschewski, Armin; Walter, Lothar; and Brandenstein, Manfred, 4,167,220, Cl. 175-337.000.
Wareham, Richard R., to Polaroid Corporation. Film assemblage of the self-developing type together with apparatus for processing thereof. 4,167,318, Cl. 354-298.000.
Warman, Bruce L., to Deere & Company. Pressurized liquid cooling system for an internal combustion engine. 4,167,159, Cl. 123-41.080.
Warnaco Inc.: *See*—
Aldrich, William E., 4,167,604, Cl. 428-359.000.
Warren, William H. Cracking head for an egg breaking machine. 4,167,138, Cl. 99-498.000.
Watchdog, Inc.: *See*—
Logan, James D.; and Swanson, Guy J., 4,167,734, Cl. 340-682.000.
Watrous, Robert B., to International Business Machines Corporation. Transducer suspension mount apparatus. 4,167,765, Cl. 360-103.000.
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Chandler, Arthur R.; and Moody, Victor, 4,167,128, Cl. 81-66.00R.
Weaver, Charles S. Worm head fishing lure. 4,167,076, Cl. 43-42.200.
Weber, Rolf: *See*—
Knappstein, Johannes; Thiersch, Friedrich; Schuch, Werner; Weber, Rolf; Beck, Kurt-Gunther; and Stahlherm, Dieter, 4,167,453, Cl. 202-141.000.
Weber, Rudolf: *See*—
Schwadtke, Karl; Kunzel, Werner; Weber, Rudolf; Puchta, Rolf; Cioc, Alexander; and Kik, Michael, 4,167,594, Cl. 427-242.000.
Wegemund, Bernd: *See*—
Linden, Heinrich; Rutzen, Horst; and Wegemund, Bernd, 4,167,420, Cl. 106-288.00B.
Linden, Heinrich; Rutzen, Horst; and Wegemund, Bernd, 4,167,421, Cl. 106-288.00B.
Weinberg, Gerd: *See*—
Munk, Edmund; Weinberg, Gerd; and Henke, Hermann, 4,167,232, Cl. 206-509.000.
Weiss, David L.: *See*—
Coe, Richard H.; McQuade, Daniel J.; and Weiss, David L., 4,167,700, Cl. 325-32.000.
Weiss, Klaus; and Luithlen, Heinz, to Vereinigte Baubeschlagfabriken Gietsch & Co. GmbH. Ski brake. 4,167,275, Cl. 280-605.000.
Welebir, Andrew J. Preparation of long-chain carboxylic acids and alcohols. 4,167,641, Cl. 568-884.000.
Welsh, Thomas M.: *See*—
Davis, Bernard H.; and Welsh, Thomas M., 4,167,150, Cl. 118-33.000.
Werner & Pfleiderer: *See*—
Heimbrecht, Bernhard; 4,167,340, Cl. 366-99.000.
Westdale, Virgil W.; and Kumins, Charles A., to AM International, Inc. Improved method for making reproductions of a graphic original from a high output electrostatic reproduction equipment. 4,167,411, Cl. 96-1.0SD.
Western Electric Company, Inc.: *See*—
Beckenbaugh, William M.; and Morton, Kim L., 4,167,601, Cl. 428-209.000.
Schaaf, Theodore F., 4,167,240, Cl. 228-196.000.
Westinghouse Electric Corp.: *See*—
Cross, Michael A.; and Hurt, Fred S., 4,167,328, Cl. 356-5.000.
Gemp, Robert S., 4,167,707, Cl. 328-55.000.
Marmo, Anthony R., 4,167,081, Cl. 51-103.0TF.
Smith, Jack R.; and Reed, Terry J., 4,167,096, Cl. 60-39.28R.
Young, Robert R., 4,167,210, Cl. 165-47.000.
Westley, John; and Liu, Chao-Min, to Hoffmann-La Roche Inc. Antibiotic X-14547 and its use for increasing feed efficiency in ruminants. 4,167,579, Cl. 424-274.000.
White, Jack M., to ACF Industries, Inc. Fuel flow control system. 4,167,169, Cl. 123-140.0MC.
White, Kevin E.: *See*—
Baker, Richard H.; and White, Kevin E., 4,167,775, Cl. 363-42.000.
White, Robert S.: *See*—
Burek, Michael J.; and White, Robert S., 4,167,688, Cl. 315-178.000.
Whitesel, Lowell E. Counterbore cutting tool. 4,167,363, Cl. 408-201.000.
Whiteside, George D.: *See*—
Johnson, Bruce K.; and Whiteside, George D., 4,167,316, Cl. 354-197.000.
Whitewater Electronics, Inc.: *See*—
Quirke, Patric C., 4,167,689, Cl. 315-206.000.
Whiting Corporation: *See*—
Ames, Victor H., 4,167,142, Cl. 105-26.00R.
Whittenberger, John S., to Graphics Equipment International Corporation. Folding machine and control. 4,167,265, Cl. 270-68.00A.
Wideman, Lawson G., to Goodyear Tire & Rubber Company, The. Selective hydrogenation of cyclopentadiene to form cyclopentene using Raney nickel catalyst and ammonium hydroxide in the reaction mixture. 4,167,529, Cl. 585-274.000.
Wiggins, William H. 250 Don Park Rd., Unit 12. Fireplaces. 4,167,177, Cl. 126-121.000.
Wilcox, Milton E., to National Semiconductor Corporation. Current matrix for encoding television video signals. 4,167,751, Cl. 358-30.000.
Wilhelm Fette GmbH: *See*—
Stuben, Werner; and Zeuschner, Ulrich, 4,167,380, Cl. 425-134.000.
Wilhelm Hegenscheidt GmbH: *See*—
Berstein, Garrj; and Naumann, Hans J., 4,167,106, Cl. 72-21.000.
Wilks, Howard G., to Gould Inc. Electric fuse having gas-evolving material. 4,167,723, Cl. 337-273.000.
Willard, Miles J. Preparation of fabricated baked potato product. 4,167,588, Cl. 426-283.000.
Wm. T. Burnett & Co., Inc.: *See*—
Tucker, Richard B. C.; Fracalossi, Roland N.; and Wajer, Mark T., 4,167,612, Cl. 521-110.000.
Williams, Frederick L., to Leeds & Northrup Company. Apparatus and method for linearizing a volume loading measurement utilizing particle scattering. 4,167,335, Cl. 356-336.000.
Williams, James L.: *See*—
Keelor, John R.; and Williams, James L., 4,167,388, Cl. 425-387.100.
Williams, Mary E. Portable shampoo seat adapter with liquid run-off attachment. 4,167,048, Cl. 4-159.000.
Williams, Thomas C., to Union Carbide Corporation. Silane reactive mineral fillers. 4,167,423, Cl. 106-306.000.
Willis, Billy R.: *See*—
Varner, William L.; and Willis, Billy R., 4,167,166, Cl. 123-122.00D.
Willitts, Benjamin R., to Emhart Industries, Inc. Refrigeration system utilizing saturated gaseous refrigerant for defrost purposes. 4,167,102, Cl. 62-152.000.
Wilson, Richard A.: *See*—
Mookherjee, Braja D.; Wilson, Richard A.; Schmitt, Frederick L.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,167,497, Cl. 252-522.000.
Wilson, Wayne J.: *See*—
Valdez, Espiridion G.; and Wilson, Wayne J., 4,167,477, Cl. 209-166.000.
Wincent, Karl T.: *See*—
Englund, Costa R.; and Wincent, Karl T., 4,167,345, Cl. 400-588.000.
Wingler, Frank: *See*—
Liebig, Lothar; Wingler, Frank; Ott, Karl-Heinz; Humme, Gert; and Pischtschan, Alfred, 4,167,543, Cl. 525-74.000.
Winter, George R., III; and Anderson, Mark C., to UOP Inc. Fractionation process, control system and apparatus. 4,167,475, Cl. 208-355.000.
Winter, Richard G.; and Ramage, John H. A., to Conoco Methanation Company. Method for removing water-soluble inorganic salts and ice from heat exchange surfaces. 4,167,100, Cl. 62-82.000.
Wirth, Ernst, to Swissmechanic, Sektion Schwyz. Trash incinerating oven. 4,167,146, Cl. 110-251.000.
Wohler, Wilson H., Jr., to Texas Vet Lab, Inc. Polyvalent shipping fever vaccine. 4,167,560, Cl. 424-92.000.
Wolf, Peter H.: *See*—
Mower, Dan C.; Wolf, Peter H.; Slade, Boyd E.; and Albertalli, David, 4,167,342, Cl. 400-124.000.
Wolff Manufacturing Company: *See*—
Janssen, Harvey W., 4,167,058, Cl. 29-822.000.
Wolkstein, Herbert J.; Rosen, Arye; and Goel, Jitendra, to RCA Corporation. Microwave power limiter comprising a dual-gate FET. 4,167,681, Cl. 307-237.000.
Wong, John L., to Research Corporation. Polycyclic chlorinated amines. 4,167,637, Cl. 546-80.000.
Wong, Tony K. M., to Morgan Adhesives Company. Method of heat lamination and laminated product. 4,167,431, Cl. 156-244.110.
Wood, William D.: *See*—
Edmonson, Orvan D.; and Wood, William D., 4,167,221, Cl. 180-19.00H.
Woodard, Kenneth E., Jr.: *See*—
Kadija, Igor V.; and Woodard, Kenneth E., Jr., 4,167,469, Cl. 204-296.000.
Wosika, Leon R.; and Vawter, John G., to International Harvester Company. Gas turbine engines with improved compressor-combustor interfaces. 4,167,097, Cl. 60-39.310.
Wright, Harold G.; and Silbaugh, Ronald D., to Scranton Manufacturing. Mounting structure for a running board. 4,167,272, Cl. 280-163.000.
Wright, Richard L.: *See*—
Koontz, Paul G.; Wright, Richard L.; and Cantu, Arthur M., 4,167,674, Cl. 250-481.000.
Wu, Alexander C., to Burroughs Corporation. Method and apparatus for xerographically printing a composite record based on fixed and variable data. 4,167,324, Cl. 355-3.00R.
Wulbrecht, Robert M.: *See*—
Bell, Lon E.; Hamilton, Brian K.; Dickie, William R.; Wulbrecht, Robert M.; and Radke, Donald G., 4,167,276, Cl. 280-731.000.
Wunsch, Erich, to Max-Planch-Gesellschaft zur Forderung der Wissenschaften. Phlorethyl-β-alanyl-secretine. 4,167,508, Cl. 260-112.50R.
Xenon Corporation: *See*—
Panico, C. Richard, 4,167,669, Cl. 250-341.000.
Xtazy de Million-Czarnecki, Maria. Unitary garment. 4,167,042, Cl. 2-105.000.
Yamada, Makoto; and Kinaga, Eiichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Tongue plate device for use in seat belt system. 4,167,054, Cl. 24-171.000.
Yamada, Seiji: *See*—
Nanba, Yasuhiro; Beppu, Norio; and Yamada, Seiji, 4,167,315, Cl. 354-106.000.
Yamagishi, Hiroshi: *See*—
Ohsawa, Mitsuo; Nakazawa, Hiroshi; and Yamagishi, Hiroshi, 4,167,649, Cl. 179-1.0GE.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Matsushita, Yukio; and Handa, Kenichi, 4,167,160, Cl. 123-73.00A.

Yamamoto, Kaichi: *See*—
Nagumo, Fumio; and Yamamoto, Kaichi, 4,167,754, Cl. 358-167.000.
Yamamoto, Katsunobu: *See*—
Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, 4,167,718, Cl. 335-284.000.
Yamamoto, Yoshihisa, to Nippondenso Co., Ltd. Fuel injection apparatus. 4,167,168, Cl. 123-139.0AT.
Yamamoto, Yutaka: *See*—
Ichiba, Terumichi; Kawaguchi, Munetaka; and Yamamoto, Yutaka, 4,167,305, Cl. 350-96.340.
Yamamura, Yukio; Hamabe, Takafumi; and Sugai, Haruo, to Matsushita Electric Works, Ltd. Massage apparatus. 4,167,182, Cl. 128-56.000.
Yamanaka, Makoto; Mikata, Tsuruo; Takano, Satoshi; Okamoto, Kikuhiko; and Saito, Fumio, to Kao Soap Co., Ltd. Non-allergenic lanolin compositions. 4,167,518, Cl. 260-397.250.
Yamanaka, Takashi; and Kondo, Keikichi, to Mitsubishi Denki Kabushiki Kaisha. Operation mechanism of switch. 4,167,659, Cl. 200-153.00E.
Yamashita, Keitaro: *See*—
Harada, Hideki; Yamashita, Keitaro; and Yamamoto, Katsunobu, 4,167,718, Cl. 335-284.000.
Yamauchi, Hiroyuki: *See*—
Sekiya, Tetsuo; Uchida, Hiroyuki; Yamauchi, Hiroyuki; and Umeda, Kenkichi, 4,167,692, Cl. 318-138.000.
Yamazaki, Hironobu; Sugino, Eiji; and Yuchida, Yoshiaki, to Tekken Construction Co. Ltd. Shield type hydraulic tunnel boring machine. 4,167,290, Cl. 299-1.000.
Yano, Takashi; Tani, Tatsuo; Seko, Nachio; Idenawa, Hiroyuki; and Nakamura, Isao, to Ricoh Company, Ltd. Electrostatic copying system having monitoring devices. 4,167,322, Cl. 355-3.00R.
Yasui Sangyo Co., Ltd.: *See*—
Hihara, Yukiyosi, 4,167,118, Cl. 73-487.000.
Yissum Research Development Company of the Hebrew University of Jerusalem: *See*—
Selhub, Jacob; Rachmilewitz, Bracha; and Grossowicz, Nathan, 4,167,556, Cl. 424-1.000.
Yoshida, Hidetsugu: *See*—
Shimada, Keizo; Harada, Toshiaki; Koga, Masahiro; Nagahama, Shizuo; Minematsu, Hiroyoshi; and Yoshida, Hidetsugu, 4,167,506, Cl. 260-37.00N.
Yoshida, Minoru: *See*—
Shirato, Toru; Yoshida, Minoru; and Mizuguchi, Hideki, 4,167,384, Cl. 425-183.000.
Yoshida, Morio; Asato, Ikuo; Semba, Toru; and Murase, Kiyoshi, to Toa Paint Company, Ltd. Process for extending the life of an antifouling paint film. 4,167,597, Cl. 427-407.00B.
Yoshida, Tadao: *See*—
Suzuki, Tadao; and Yoshida, Tadao, 4,167,710, Cl. 330-298.000.
Yosikawa, Masanori: *See*—
Terada, Hideto; and Yosikawa, Masanori, 4,167,206, Cl. 164-7.000.
Young, Alan C.: *See*—
Lucas, James G.; and Young, Alan C., 4,167,739, Cl. 343-854.000.
Young, James E.; Cushman, George O., deceased; and by Cushman, Ruth N., executrix. Automatic distance compensating sight and process of sighting. 4,167,333, Cl. 356-247.000.
Young, Robert R., to Westinghouse Electric Corp. Electric heat module mounting arrangement for roof top type air conditioning unit. 4,167,210, Cl. 165-47.000.
Yuchida, Yoshiaki: *See*—
Yamazaki, Hironobu; Sugino, Eiji; and Yuchida, Yoshiaki, 4,167,290, Cl. 299-1.000.
Yuda, Lawrence F. Compact fluid actuator. 4,167,134, Cl. 91-405.000.
Zahid, Abduz, to Greer Hydraulics, Inc. Pressure accumulator with failure indicator. 4,167,201, Cl. 138-30.000.
Zahler, Wolf-Dieter: *See*—
Schmitt, Werner; Purrman, Robert; Jochum, Peter; and Zahler, Wolf-Dieter, 4,167,618, Cl. 528-424.000.
Zahn, Heinrich, to Robert Bosch GmbH. Tape recorder/reproducer for selectably operating in reel-to-reel and cassette modes. 4,167,256, Cl. 242-194.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; Takeuchi, Tomio; and Hamada, Masa, 4,167,448, Cl. 435-70.000.
Zaman, Shakir U.: *See*—
Noyes, Richard C.; Zaman, Shakir U.; and Stuteville, Douglas W., 4,167,443, Cl. 176-36.00R.
Zeuschner, Ulrich: *See*—
Stuben, Werner; and Zeuschner, Ulrich, 4,167,380, Cl. 425-134.000.
Zeyra, Avraham, to Creative Balloons, Inc. Apparatus for inflating toy balloons. 4,167,204, Cl. 141-348.000.
Zhurzhenko, Valentina P.: *See*—
Svirsky, Lazar D.; Zhurzhenko, Valentina P.; Bondarenko, Tamara S.; Savenkova, Antonina K.; Kazakevich, Valery M.; Shneerov, Yakov A.; Ogryzkin, Evgeny M.; Geizenblaz, Anatoly A.; Kolganov, Gennady S.; Burshtein, Vladislav V.; Sivakov, Vladimir F.; Bogdanovich, Evgeny A.; Burdonos, Vitaly M.; Andrjuschenko, Viktor N.; Bushinsky, Oleg A.; Makarov, Grigory A.; Filonov, Oleg V.; Tupitsa, Vladimir I.; Nikitenko, Valery I.; and Omes, Nikolai M., 4,167,418, Cl. 106-38.280.
Ziegner, Bernhard A.: *See*—
Christ, Allen E.; Sprague, Dennis R.; and Ziegner, Bernhard A., 4,167,413, Cl. 96-36.200.
Zielinski, Edward A.; and Comparato, Joseph R., to Combustion Engineering, Inc. Fluid-bed air-supply system. 4,167,157, Cl. 122-4.00D.
Zielke, Alfred, to ELMEG-Elektro-Mechanik Gesellschaft mit beschrankter Haftung. Keyboard with mechanical encoding. 4,167,657, Cl. 200-5.0EA.
Zizine, Jean-Louis, to S.C.I. Le Brin. Device for measuring the mass flow or flow rate of a gas. 4,167,114, Cl. 73-194.00F.
Zolla, Bruno, to Alfachimici S.p.A. Composition for the electroless deposition of nickel base alloys. 4,167,416, Cl. 106-1.250.
Zoltai, Attila: *See*—
Bognar, Rezso; Makleit, Sandor; Kiss, Geza; Berenyi, Sandor; Mile, Terez; Knoll, Jozsef; Elek, Sandor; Gyoker, Istvan; Zoltai, Attila; Toth, Gyorgy; and Litkei, Laszlo, 4,167,636, Cl. 546-46.000.
Zontelli, Gary R. Cutter ring for trimming printed circuit boards. 4,167,132, Cl. 83-676.000.
Zumbrunn, Robert. Letter envelope and display. 4,167,241, Cl. 229-928.000.
Zussman, Hyman W.; Knell, Martin; and Dexter, Martin, to Ciba-Geigy Corporation. Unsaturated hydantoin coagents. 4,167,465, Cl. 204-159.150.
Zvetkov, Atanas Z.; and Zvetkov, Stanislav Z., to DSO "RODOPA". Variable-speed chain drive unit. 4,167,124, Cl. 74-230.190.
Zvetkov, Stanislav Z.: *See*—
Zvetkov, Atanas Z.; and Zvetkov, Stanislav Z., 4,167,124, Cl. 74-230.190.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF SEPTEMBER, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Beeck, Carlos L., to Tektronix, Inc. Optoelectronic switch. Re. 30,094, Cl. 250-229.000.

Burger, Norman D. Aerosol dispensing system. Re. 30,093, Cl. 222-95.000.

Burroughs Corporation: *See*—
Miller, Donald E., Re. 30,095, Cl. 340-714.000.

Miller, Donald E., to Burroughs Corporation. Display panel using glow spreading principles. Re. 30,095, Cl. 340-714.000.

Ovutime, Inc.: *See*—
Schuster, Samuel R., Re. 30,092, Cl. 73-54.000.

Schuster, Samuel R., to Ovutime, Inc. Mucus testing processes and devices. Re. 30,092, Cl. 73-54.000.

Tektronix, Inc.: *See*—
Beeck, Carlos L., Re. 30,094, Cl. 250-229.000.

LIST OF PLANT PATENTEES

Jackson & Perkins Company: *See*—
Warriner, William A., 4,459, Cl. 11.000.

Warriner, William A., to Jackson & Perkins Company. Rose plant. 4,459, 9-11-79, Cl. 11.000.

LIST OF DESIGN PATENTEES

ACF Industries, Incorporated: *See*—
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 252,870, Cl. D12-46.000.

Ahern, Thomas L., to Schoon, Darrel R. Handbag. 252,895, 9-11-79, Cl. D3-53.000.

Altman, Charles W. Spotlight. 252,893, 9-11-79, Cl. D48-20.00K.

American Optical Corporation: *See*—
Johnsen, David W., 252,882, Cl. D16-65.000.

Barr, Josef J. Necklace or similar article. 252,863, 9-11-79, Cl. D11-6.000.

Barr, Josef J. Necklace or similar article. 252,864, 9-11-79, Cl. D11-6.000.

Barr, Josef J. Necklace or similar article. 252,865, 9-11-79, Cl. D11-6.000.

Barr, Josef J. Diamond ring. 252,866, 9-11-79, Cl. D11-34.000.

Beares, Allen G.: *See*—
Lessig, William R., III; Bunyea, Roderick F.; and Beares, Allen G., 252,879, Cl. D15-12.000.

Bellino, Ralph R.; Foster, John B.; and Powers, James R., to W. R. Grace & Co. Valve cover for an engine. 252,878, 9-11-79, Cl. D15-5.000.

Black & Decker Inc.: *See*—
Lessig, William R., III; Bunyea, Roderick F.; and Beares, Allen G., 252,879, Cl. D15-12.000.

Bunyea, Roderick F.: *See*—
Lessig, William R., III; Bunyea, Roderick F.; and Beares, Allen G., 252,879, Cl. D15-12.000.

Cannon, Thomas G.; and Mackay, Frederick G., to Teledyne Industries, Inc. Food grinder. 252,847, 9-11-79, Cl. D7-155.000.

Cavalieri, Wanda. Mascara shield. 252,890, 9-11-79, Cl. D28-7.000.

Church & Clark, Inc.: *See*—
Church, Donald R., 252,851, Cl. D8-389.000.

Church, Donald R., to Church & Clark, Inc. Two prong square flat head nail. 252,851, 9-11-79, Cl. D8-389.000.

Cole, Charles J. Shoe bottom. 252,837, 9-11-79, Cl. D2-322.000.

Corning Glass Works: *See*—
Potts, Robert S., 252,861, Cl. D10-94.000.

Crosman, Dorland L.: *See*—
Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., 252,887, Cl. D21-91.000.

Cunningham, Penny. Pendant. 252,868, 9-11-79, Cl. D11-96.000.

Daniels, George R., to Honeywell Information Systems Inc. Facade for enclosing data processing apparatus or the like. 252,875, 9-11-79, Cl. D14-40.000.

Dummermuth, Paul, to Von Arx AG. Apparatus for roughening and cleaning a surface or the like. 252,880, 9-11-79, Cl. D15-48.000.

Dummermuth, Paul, to Von Arx AG. Apparatus for roughening and cleaning a surface or the like. 252,881, 9-11-79, Cl. D15-48.000.

Dunlop Limited: *See*—
Gill, Barrington S.; and Hart, Claude A., 252,871, Cl. D12-147.000.

Dziewulski, Ted, to Phillips Petroleum Company. Flower pot or the like. 252,869, 9-11-79, Cl. D11-155.000.

Finkenbiner, Kenneth N., to Ken-Neil, Inc. Spinner for bike hub. 252,873, 9-11-79, Cl. D12-213.000.

Foster, John B.: *See*—
Bellino, Ralph R.; Foster, John B.; and Powers, James R., 252,878, Cl. D15-5.000.

Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., to ACF Industries, Incorporated. Railway car truck. 252,870, 9-11-79, Cl. D12-46.000.

Gavin, Thomas W. Coffee filter. 252,845, 9-11-79, Cl. D7-47.000.

Gill, Barrington S.; and Hart, Claude A., to Dunlop Limited. Tire. 252,871, 9-11-79, Cl. D12-147.000.

Gran-Sol, Inc.: *See*—
Picker, Henrietta S., 252,836, Cl. D2-322.000.

Hammonds, James C.: *See*—
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 252,870, Cl. D12-46.000.

Hanson, Thomas F. Wind turbine. 252,877, 9-11-79, Cl. D15-1.000.

Hart, Claude A.: *See*—
Gill, Barrington S.; and Hart, Claude A., 252,871, Cl. D12-147.000.

Hazerjian, Kevork: *See*—
Hazerjian, Minas P.; and Hazerjian, Kevork, 252,894, Cl. D48-38.000.

Hazerjian, Minas P.; and Hazerjian, Kevork. Housing for yard light. 252,894, 9-11-79, Cl. D48-38.000.

Hempstead, Willie. Toilet seat accessory. 252,889, 9-11-79, Cl. D23-71.000.

Hillmer, Robert E.: *See*—
Read, Clifford D.; Hillmer, Robert E.; and Tyson, John F., 252,876, Cl. D14-60.000.

Holt, Jan D.: *See*—
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 252,870, Cl. D12-46.000.

Honeywell Information Systems Inc.: *See*—
Daniels, George R., 252,875, Cl. D14-40.000.

Inverness Corporation: *See*—
Mann, Samuel, 252,867, Cl. D11-76.000.

Johnsen, David W., to American Optical Corporation. Spectacles frame front. 252,882, 9-11-79, Cl. D16-65.000.

Johnson, Barrett A.; Jones, Julianne; and Lucey, Edward D., to Spacial Designs, Inc. Storage unit. 252,843, 9-11-79, Cl. D6-135.000.

Jones, Julianne: *See*—
Johnson, Barrett A.; Jones, Julianne; and Lucey, Edward D., 252,843, Cl. D6-135.000.

Jones, Ronald B., to Pap-et, Inc. Game racket. 252,888, 9-11-79, Cl. D21-213.000.

Jorgensen, Clarence W., deceased; and by Jorgensen, Elva M., executrix. Burglar alarm. 252,850, 9-11-79, Cl. D8-332.000.

Jorgensen, Elva M., executrix: *See*—
Jorgensen, Clarence W., deceased; and Jorgensen, Elva M., executrix, 252,850, Cl. D8-332.000.

Kabushiki Kaisha A-One: *See*—
Kakinuma, Shihei, 252,886, Cl. D21-33.000.

Kakinuma, Shihei, to Kabushiki Kaisha A-One. Game board. 252,886, 9-11-79, Cl. D21-33.000.
Keller, Huey T., to Vaughan Furniture Company, Inc. Dining table or similar article. 252,844, 9-11-79, Cl. D6-177.000.
Ken-Neil, Inc.: *See*—
Finkenbiner, Kenneth N., 252,873, Cl. D12-213.000.
Koh, John K. Soap dish. 252,841, 9-11-79, Cl. D6-89.000.
Lang, Mark S. Bottle. 252,852, 9-11-79, Cl. D9-82.000.
Les Must de Cartier-France: *See*—
Perrin, Alain D., 252,855, Cl. D10-39.000.
Perrin, Alain D., 252,856, Cl. D10-39.000.
Perrin, Alain D., 252,857, Cl. D10-39.000.
Perrin, Alain D., 252,858, Cl. D10-39.000.
Perrin, Alain D., 252,859, Cl. D10-39.000.
Perrin, Alain D., 252,860, Cl. D10-39.000.
Lessig, William R., III; Bunyea, Roderick F.; and Beares, Allen G., to Black & Decker Inc. Electric powered earth tiller. 252,879, 9-11-79, Cl. D15-12.000.
Louis Marx & Co., Inc.: *See*—
Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., 252,887, Cl. D21-91.000.
Lucey, Edward D.: *See*—
Johnson, Barrett A.; Jones, Julianne; and Lucey, Edward D., 252,843, Cl. D6-135.000.
Mackay, Frederick G.: *See*—
Cannon, Thomas G.; and Mackay, Frederick G., 252,847, Cl. D7-155.000.
Mackay, Spencer L., to Teledyne Industries, Inc. Combined smoke and fire alarm or the like. 252,862, 9-11-79, Cl. D10-106.000.
Mann, Samuel, to Inverness Corporation. Ear-piercing earring. 252,867, 9-11-79, Cl. D11-76.000.
Mate Balmes, Manuel, to Playme, S.A. Pencil sharpener. 252,883, 9-11-79, Cl. D19-73.000.
Mate Balmes, Manuel, to Playme, S.A. Pencil sharpener. 252,884, 9-11-79, Cl. D19-73.000.
Mate Balmes, Manuel, to Playme, S.A. Pencil sharpener. 252,885, 9-11-79, Cl. D19-73.000.
McKee, Raymond J. Paper roll holder. 252,842, 9-11-79, Cl. D6-97.000.
Melcher, Conway H.: *See*—
Garner, Gerald D.; Hammonds, James C.; Holt, Jan D.; and Melcher, Conway H., 252,870, Cl. D12-46.000.
Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., to Louis Marx & Co., Inc. Launcher for a toy glider. 252,887, 9-11-79, Cl. D21-91.000.
Miller, Paul J. Pitcher or similar article. 252,846, 9-11-79, Cl. D7-64.000.
Neff, Ralph D., to Vernitron Corporation. Electrical wiring conduit. 252,874, 9-11-79, Cl. D13-13.000.
Northern Telecom Limited: *See*—
Read, Clifford D.; Hillmer, Robert E.; and Tyson, John F., 252,876, Cl. D14-60.000.
Ortiz, Ruben G. Rocking chair. 252,839, 9-11-79, Cl. D6-49.000.
Pap-et, Inc.: *See*—
Jones, Ronald B., 252,888, Cl. D21-213.000.
Perkins, Martin B. Display box. 252,853, 9-11-79, Cl. D9-221.000.
Perrin, Alain D., to Les Must de Cartier-France. Watch. 252,855, 9-11-79, Cl. D10-39.000.
Perrin, Alain D., to Les Must de Cartier-France. Watch. 252,856, 9-11-79, Cl. D10-39.000.
Perrin, Alain D., to Les Must de Cartier-France. Watch. 252,857, 9-11-79, Cl. D10-39.000.
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Perrin, Alain D., to Les Must de Cartier-France. Watch. 252,859, 9-11-79, Cl. D10-39.000.
Perrin, Alain D., to Les Must de Cartier-France. Watch. 252,860, 9-11-79, Cl. D10-39.000.
Phillips Petroleum Company: *See*—
Dziewulski, Ted, 252,869, Cl. D11-155.000.
Picker, Henrietta S., to Gran-Sol, Inc. Footwear sole. 252,836, 9-11-79, Cl. D2-322.000.
Playme, S.A.: *See*—
Mate Balmes, Manuel, 252,883, Cl. D19-73.000.
Mate Balmes, Manuel, 252,884, Cl. D19-73.000.
Mate Balmes, Manuel, 252,885, Cl. D19-73.000.
Potts, Robert S., to Corning Glass Works. Base for a pH meter electrode arm. 252,861, 9-11-79, Cl. D10-94.000.
Powers, James R.: *See*—
Bellino, Ralph R.; Foster, John B.; and Powers, James R., 252,878, Cl. D15-5.000.
Raintree Buckle & Jewelry, Inc.: *See*—
Van Brouwer, Ryk, 252,838, Cl. D2-431.000.
Read, Clifford D.; Hillmer, Robert E.; and Tyson, John F., to Northern Telecom Limited. Base for telephone set. 252,876, 9-11-79, Cl. D14-60.000.
Reppert, Merlyn R., to W. R. Grace & Co. Wheel. 252,872, 9-11-79, Cl. D12-211.000.
Scholten, Menno. Chair or the like. 252,840, 9-11-79, Cl. D6-50.000.
Schoon, Darrel R.: *See*—
Ahern, Thomas L., 252,895, Cl. D3-53.000.
Shigenori, Terada, to Tomy Kogyo, Co., Inc. Toy vehicle. 252,892, 9-11-79, Cl. D21-134.000.
Spacial Designs, Inc.: *See*—
Johnson, Barrett A.; Jones, Julianne; and Lucey, Edward D., 252,843, Cl. D6-135.000.
Spencer, Richard O. Record cleaner. 252,848, 9-11-79, Cl. D7-161.000.
Stutzer, Charles. Tray for cosmetics. 252,891, 9-11-79, Cl. D28-76.000.
Talesfore, Nicholas F. Digital clock. 252,854, 9-11-79, Cl. D10-15.000.
Teledyne Industries, Inc.: *See*—
Cannon, Thomas G.; and Mackay, Frederick G., 252,847, Cl. D7-155.000.
Mackay, Spencer L., 252,862, Cl. D10-106.000.
Tomy Kogyo, Co., Inc.: *See*—
Shigenori, Terada, 252,892, Cl. D21-134.000.
Tyson, John F.: *See*—
Read, Clifford D.; Hillmer, Robert E.; and Tyson, John F., 252,876, Cl. D14-60.000.
Van Brouwer, Ryk, to Raintree Buckle & Jewelry, Inc. Belt buckle. 252,838, 9-11-79, Cl. D2-431.000.
Vaughan Furniture Company, Inc.: *See*—
Keller, Huey T., 252,844, Cl. D6-177.000.
Vernitron Corporation: *See*—
Neff, Ralph D., 252,874, Cl. D13-13.000.
Vernon, John A.: *See*—
Meyers, Michael R.; Vernon, John A.; and Crosman, Dorland L., 252,887, Cl. D21-91.000.
Von Arx AG: *See*—
Dummermuth, Paul, 252,880, Cl. D15-48.000.
Dummermuth, Paul, 252,881, Cl. D15-48.000.
W. R. Grace & Co.: *See*—
Bellino, Ralph R.; Foster, John B.; and Powers, James R., 252,878, Cl. D15-5.000.
Reppert, Merlyn R., 252,872, Cl. D12-211.000.
Weiss, Irwin D. Container opening tool. 252,849, 9-11-79, Cl. D8-18.000.

CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 11, 1979

NOTE.—First number, class; second number, subclass; third number, patent number

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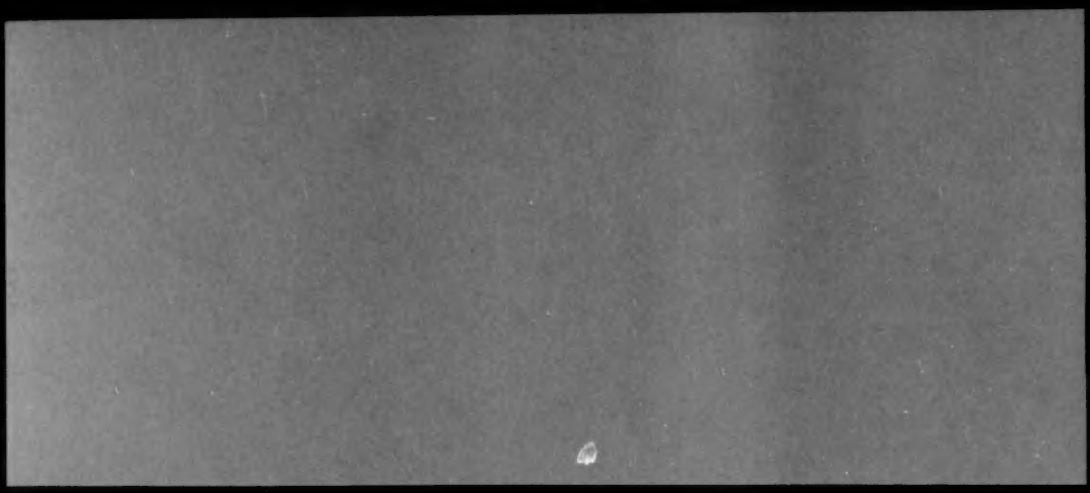

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